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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

The Secretions of the Brain
Prof. S. ZUCKERMAN, M.D., F.R.S. 789
Trigeminal Neuralgia
G. F. ROWBOTHAM, F.R.C.S. ... 796
Anæsthetic Explosions
JOHN BULLOUGH, M.B. 798
Clinical Tests for Ketonuria
JOHN NASH, M.R.C.P.
JOHN LISTER, M.R.C.P.
D. H. VOBES, A.I.M.L.T. 801
Potentiation of Cortisone by Glycyrrhetinic Acid
F. DUDLEY HART, F.R.C.P.
J. C. LEONARD, M.R.C.P. 804
Liquorice Extract in Addison's Disease
R. J. CALVERT, M.R.C.P. 805
Intravascular Hæmolysis in Cholera
Prof. S. N. DE, M.B.
K. P. SENGUPTA, M.B.
N. N. CHANDA, M.B. 807
Plasma-insulin Activity in Hypopituitarism
P. J. RANDLE, M.B. 809
A Sensitive Digital Plethysmograph
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SPECIAL ARTICLES

The Mental Health of Undergraduates in England
J. C. READ, M.R.C.S. 822
The Distressed Student
NICOLAS MALLESON, M.R.C.P. 824
Doubly Handicapped Children .. 826

LEADING ARTICLES

THE BOMBS 815
DETECTION OF TUBERCULOUS CONTACTS 816
THE SARDINIAN CAMPAIGN 817

ANNOTATIONS

Cholecystography and Cholangiography 818
Anæsthetic Explosions 818
Control of Trichinosis 819
Peripheral Arterial Embolism ... 819
Oxford University and the Radcliffe 820
Eggs and Rheumatic Fever 820
The Fever Nurse 821
Hæmolysis and Eclampsia 821

RECONSTRUCTION

The Australian Health Service .. 827

LETTERS TO THE EDITOR

Treatment of Hyperthyroidism (Mr. Peter McEwan, F.R.C.S.) .. 830
Kwashiorkor (Prof. J. F. Brock, F.R.C.P., Dr. M. Autret) 830
Hospital Beds for Children (Mr. M. C. Hardie) 831
The Face in Diagnosis (Mr. Fayek Ghabrial, M.CH.) 831
The Curability of Cancer (Mr. Malcolm Donaldson, F.R.C.S.). 832
Benzathine Penicillin in Yaws (Dr. E. I. Grin, Dr. T. Guthe). 832
Dosage of Mephenesin (Dr. D. F. Cross) 833
On Credulity (Mrs. Thomas) 833
Tubo-ovarian Torsion and Torsion of Hydrosalpinx in Childhood (Mr. R. F. Read, F.R.C.S.) 833
Treatment of Varicose Ulcers (Mr. Roland N. Jones, F.R.C.S.; Dr. Stanley Rivlin) 834
Blindness and Oxygen (Dr. Lars Gyllensten, Dr. Bo Hellström) 834
Tuberculosis Yardsticks (Dr. C. J. Stewart, Dr. D. van Zwanenberg) 834
Hospital, Doctor, and Patient (Mr. R. A. King, F.R.C.S.) 835
New Tank Respirators (Dr. James Macrae) 835
Spondylosis (Dr. James F. Brailsford; Mr. Francis Bauer, F.R.C.S.E.) 835

REVIEWS

Notices of Books 814

MEDICINE AND THE LAW

Spinal Anæsthesia 826

PUBLIC HEALTH

Scotland in 1953 828
Infection from Telephones 828

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents .. 829

PARLIAMENT

The Budget 836
Health and Welfare 836
Question Time 837

OBITUARY

Thomas Carnwath 837
Henry William Marett Tims 838

NOTES AND NEWS

World Health Organistaion 839
Hunterian Influence in Exeter .. 839
A Home for Backward Children . 839
N.H.S. Ambulance Services 839
Aluminium Hospital Buildings .. 839
Standard for Transfusion Equipment 839
Operation on Conjoined Twins .. 840

University of London 840
University of Leeds 840
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Diary of the Week 838
Appointments 838

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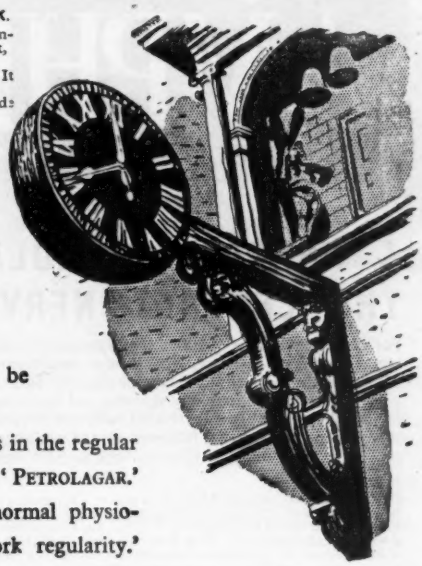

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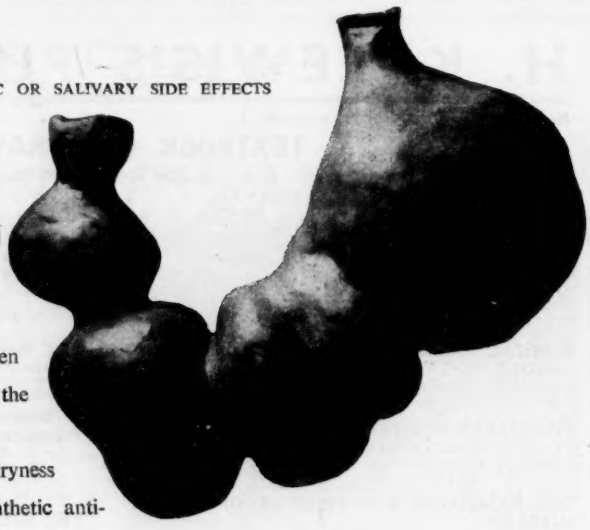

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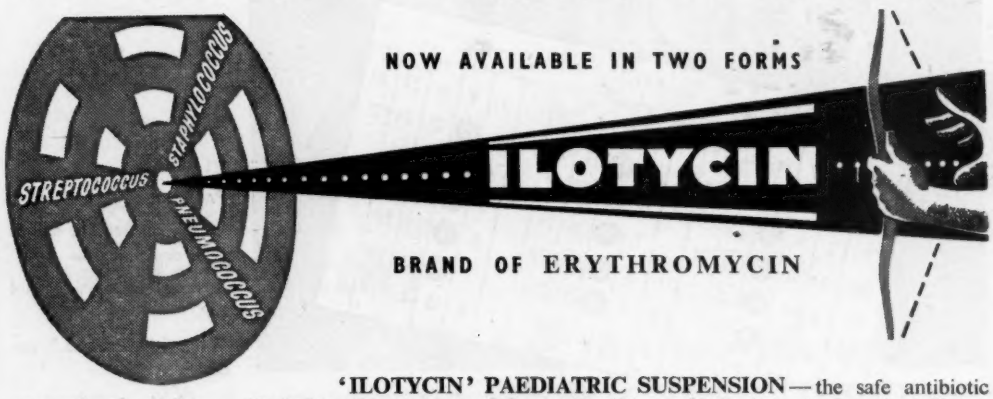

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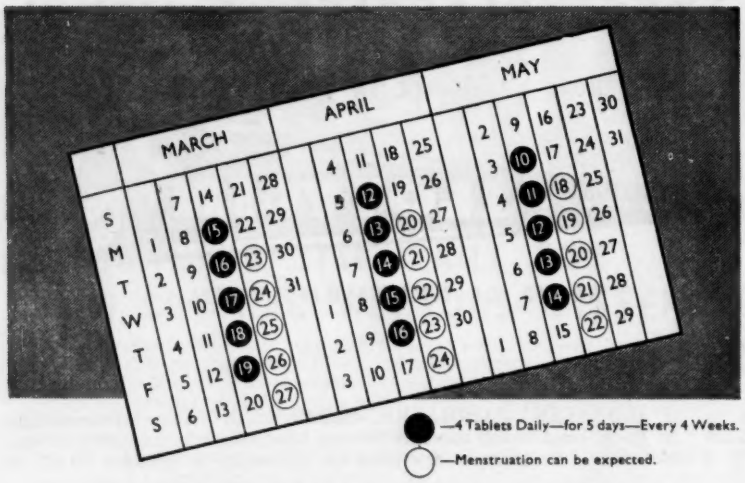

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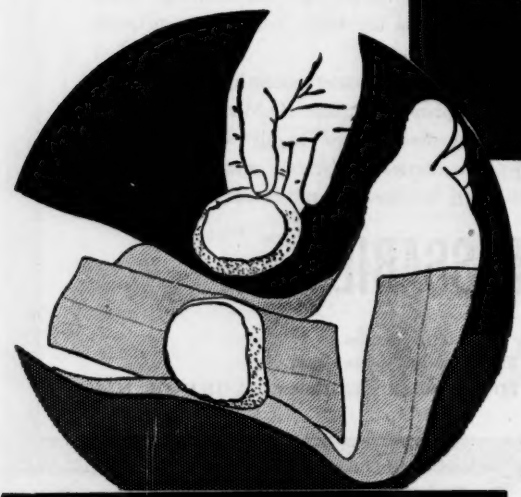
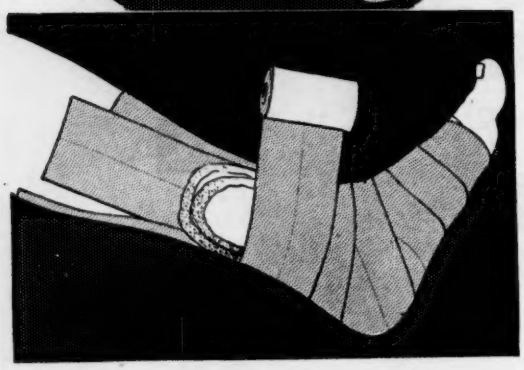
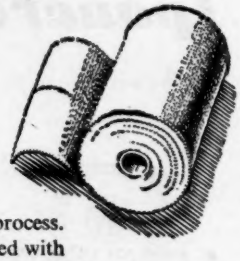




In the treatment of varicose ulcers . . . careful bandaging is essential in order to achieve the best results. Drawing together of ulcer edges by strapping — extra pressure by means of sponge rubber — vertical strips and carefully applied Elastoplast bandaging are some of the important points in technique.



Elastoplast

TRADE MARK

POROUS ADHESIVE BANDAGES

The adhesive mass of Elastoplast is now rendered porous by a special process. The bandage with the Porous Adhesive has all the advantages associated with Elastoplast — firm adhesion, compression and support — while permitting free evaporation of sweat. The price is unchanged.

When prescribing Elastoplast, add "Porous Adhesive" to your script. Full details from Smith & Nephew Ltd., Welwyn Garden City, Herts., the marketing organisation of T. J. Smith & Nephew Ltd., Hull.

Outside the British Commonwealth, Elastoplast and Elastocrepe are known as Tensoplast and Tensocrepe respectively.

Towards meeting the demands of growth

THE higher metabolic needs of the young which accompany natural growth and development and which are further increased by heavy daily expenditure of energy, tend to diminish reserves of physical and nervous vitality.

'OVALTINE' provides a useful supplement to help to satisfy the extra needs for proximate and accessory food principles. The malt, milk, cocoa, soya and eggs which 'Ovaltine' contains are blended to form a highly nutritious food beverage —deliciously flavoured and easily assimilated.

IT is of value in helping to maintain normal weight increase and is of undoubted help to those recovering from the debilitating effects of the common fevers of childhood.

FOR growing children 'Ovaltine' is a dietary reinforcement which can be routinely recommended with confidence.

OVALTINE

Vitamin Standardization per oz.—Vitamin B_1, 0.3 mg.; Vitamin D, 350 i.u.; Niacin, 2 mg.

A. WANDER LIMITED, 42 Upper Grosvenor Street, London W.1.

Manufactory, Farms and 'Ovaltine' Research Laboratories: King's Langley, Herts.

M.384

A NEW approach to an old problem

BLANDLAX

Restores normal bowel function without use of liquid paraffin

Safe for patients of all ages

Blandlax is efficient

BLANDLAX is a liquid preparation of prehydrated sodium carboxymethylcellulose, incorporating a sub-laxative dose of magnesium hydroxide. It prevents undue faecal dehydration, encourages the restoration of normal bowel function, and is soothing to inflamed mucosa.

Blandlax is safe

BLANDLAX is not habit forming; it contains no mineral oil or purgative and, therefore, cannot cause "leakage" or griping. It is devoid of the disadvantages associated with the administration of dry preparations of carboxymethylcellulose. With its agreeable flavour and creamy consistency, BLANDLAX is pleasant and easy to take.

Indications

BLANDLAX is specifically indicated in the treatment of constipation associated with colitis, hæmorrhoids, pregnancy, peptic and duodenal ulcer, etc.

Supplied in bottles of 8 fl. oz. 16 fl. oz. & 80 fl. oz.
Retail prices 2/6d., 4/6d. and 18/-.

All subject to the usual discounts.

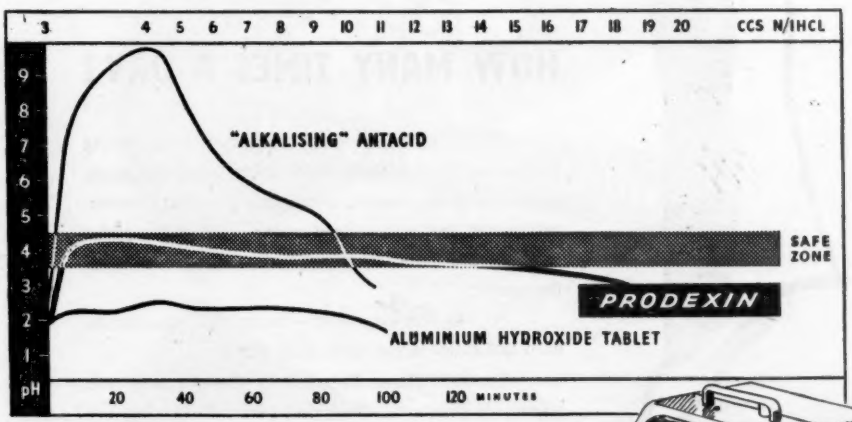
Descriptive literature obtainable from The Medical Department Boots Pure Drug Co. Ltd. Nottingham, England

Boots

S 195

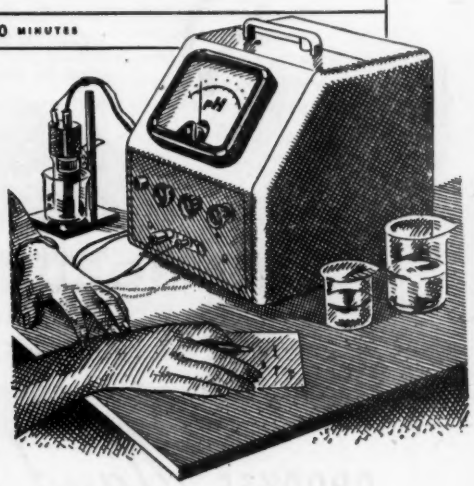
A New development providing *CONTROLLED* antacid therapy

Prodexin is a new product containing aluminium glycinate, and belongs to the buffer group of antacids. It depends for its action upon the slow release, on hydrolysis, of active aluminium hydroxide gel and glycine (amino acetic acid). Glycine rapidly raises the pH to 2, sparing the aluminium gel for the later stage of raising it into the "safe zone" of pH 3·5 to 4·5. Prodexin maintains an equable gastric environment for long periods without alkalisation.



Prodexin provides a convenient, economical and safe treatment for HYPERACIDITY and PEPTIC ULCER.

The tablets, sucked one at a time, maintain the pH of the stomach contents within the "safe zone" for up to two hours. With Prodexin there is no risk of acid rebound or alkalosis. Prodexin tablets are pleasant to suck and they do not form gritty particles in the mouth or give rise to constipation.



PRODEXIN

Each tablet contains:—

Aluminium glycinate.....0·9 gramme.
(*dihydroxy aluminium aminoacetate*)
Light magnesium carbonate.....0·1 gramme.

The basic N.H.S. cost of treatment at the rate of 6 Prodexin tablets daily is 8½d.

Manufactured in the laboratories of

C. L. BENCARD LIMITED

MINERVA ROAD · PARK ROYAL · LONDON N.W.10

BENCARD

HOW MANY TIMES A DAY?

Washing, scrubbing up, drying, washing, dipping the hands into plaster, into spirit, washing again with detergents, soaps, antiseptics ; in hard water, soft water, hot water, cold water . . . Is it a wonder that doctors' hands become, well, a little the worse for wear ?

All this is unavoidable—except that your hands need not suffer if you look after them.

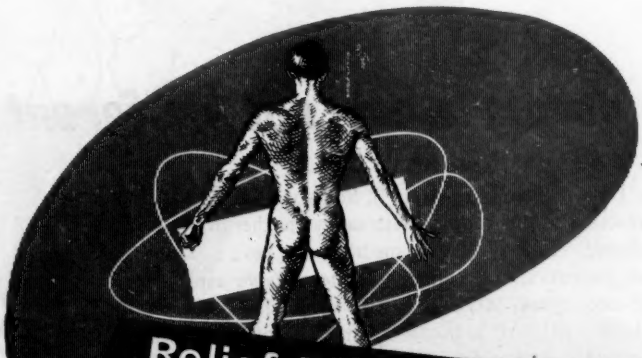
Crookes Hand Cream and Hand Lotion are admirable products. Rich and penetrating, they are ideal for counteracting the otherwise inevitable effects of " over-washing." Most economical in use, they should be massaged well into the skin when it will be found that nails and cuticles are nourished and the skin left soft and smooth, yet in no way greasy.

Both Crookes Hand Cream and Lotion contain hexachlorophene, a new substance which kills micro-organisms of the skin bacterial flora yet is bland and harmless to the skin tissue itself.

CROOKES *Hand Cream & Lotion*

Specimens and literature on request.

THE CROOKES LABORATORIES LIMITED • PARK ROYAL • LONDON N·W·10



Relief From Itching

Anusol Haemorrhoidal Ointment represents a perfect blend of antiseptic, decongestive and emollient constituents. It is a safe and effective palliative for use in peri-anal conditions such as pruritus and eczema. It may be used in conjunction with Anusol Haemorrhoidal Suppositories in the treatment of piles; its bland and soothing consistency make it of particular value in peri-anal pruritus.

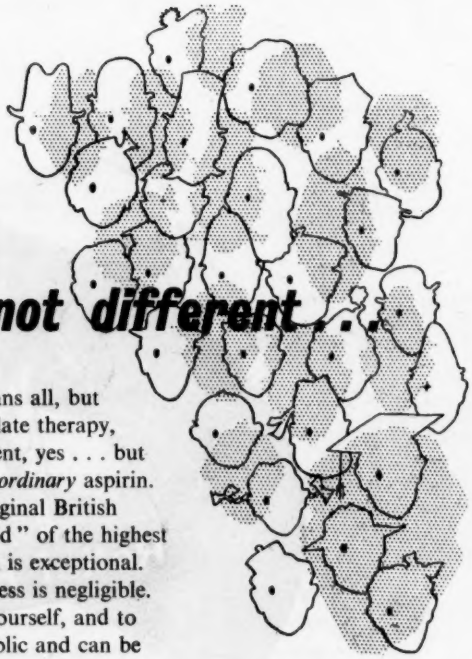
FORMULA: *Bismuth subgallate 2.12%, Bismuth oxyiodogallate 0.03%, Bismuth oxide 0.87%, Resorcin 0.87%, Balsam of Peru 1.77%, Zinc oxide 10.60%, Boric acid 17.85%, Base of cacao butter and beeswax q.s. ad 100.00%.*

PACKING: *Ointment: 1 oz. tubes. Suppositories: Boxes of 12; also boxes of 100 for dispensing purposes (not subject to P.T. on prescription).*

ANUSOL

No Warner product has ever been advertised to the public.

WILLIAM R. WARNER & CO. LTD.,
Power Road, London, W.4



If only people were not different . . .

Tom, Dick or Harry (or Mary!), humans all, but each one reacting so differently. With salicylate therapy, for example. A most valuable medicament, yes . . . but innumerable patients simply cannot tolerate *ordinary* aspirin.

We recommend MINAC . . . the original British *buffered* analgesic. MINAC is first an "antacid" of the highest order — secondly, its rapidity of absorption is exceptional. With MINAC the possibility of gastric distress is negligible.

We invite you to test MINAC for yourself, and to prescribe it. It is not advertised to the public and can be prescribed on E.C.10 forms for N.H.S. purposes.

For confident prescription . . . ★

BUFFERED ANALGESIC

Minac BRAND
Regd. Trade Mark

FORMULA: *Acid Acetylsalicyl B.P. 49·4 % w/w; Mag. Carb. Pond. B.P. 19·7 % w/w; Aluminium Dihydroxyaminoacetate 9·9 % w/w.*

★ **Ref:** (1944) J. Pharmacol. **82:** 247.

SAMPLES AND LITERATURE ON REQUEST

FASTER IN ACTION
THAN ORDINARY ASPIRIN
INVALUABLE IN MINIMISING
GASTRIC DISTRESS

Manufactured only by:

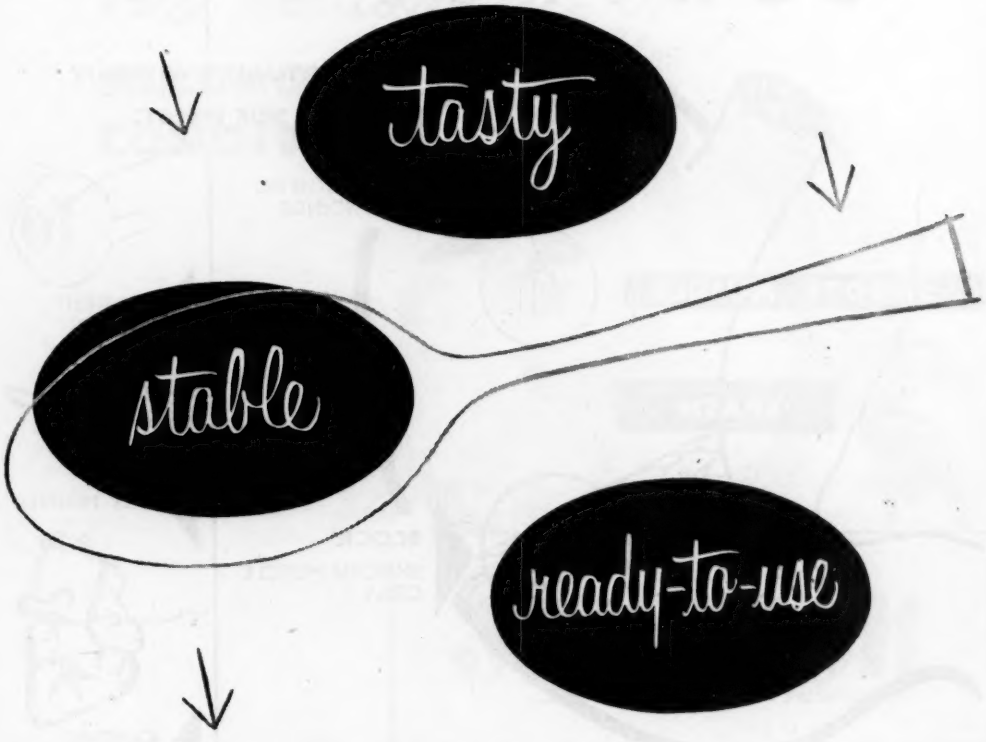
WILLOWS FRANCIS
PHARMACEUTICAL PRODUCTS LTD

Registered Trade Mark

Established 1751

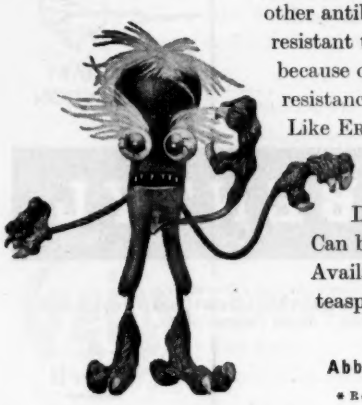
73 SHACKLEWELL LANE, LONDON, E.8 *Tel: Clissold 6361 (5 lines)*

Also at Birmingham and Cardiff



paediatric **ERYTHROCIN*** stearate oral suspension

Now, the therapeutic advantages of ERYTHROCIN in a sweet, cinnamon-flavoured suspension. *Paediatric* ERYTHROCIN Suspension is ready for instant use—remains potent for at least 18 months. *Especially indicated* against staphylococcal, streptococcal and pneumococcal infections . . . when children are sensitive to other antibiotics or when the infecting organism is resistant to other antibiotics . . . in staphylococcal infections, because of the high incidence of staphylococcal resistance to penicillin and other antibiotics.



Like ERYTHROCIN tablets, *Paediatric* ERYTHROCIN Suspension is specific in action—*less likely to alter the normal intestinal flora than other oral antibiotics, except penicillin.*

Dosage is 2 to 3 mg./lb. at four to six-hour intervals. Can be administered before, after or with meals. Available in 2 fluid ounce (60 c.c.) bottles. Each 5 c.c. teaspoonful represents 100 mg. ERYTHROCIN.

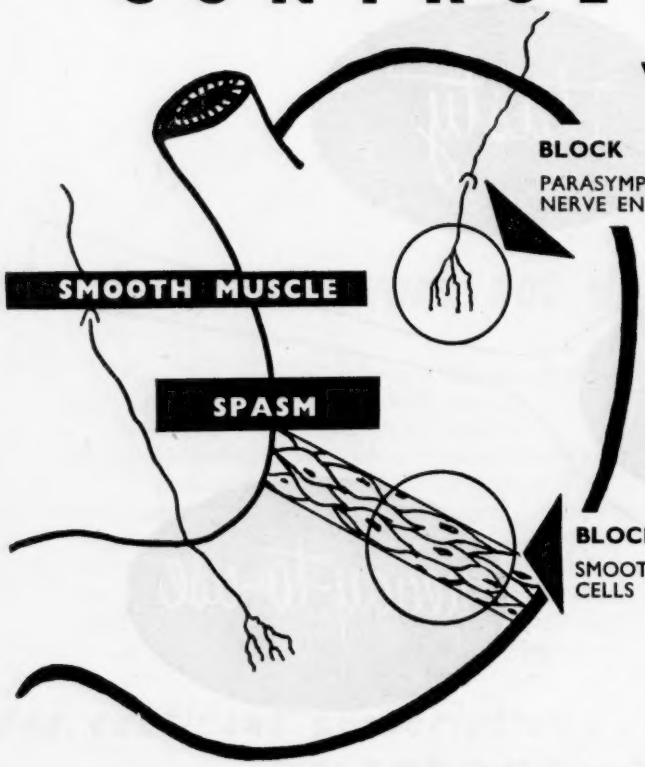
Abbott

Abbott Laboratories Ltd · Perivale · Greenford · Middlesex

* Regd. Trade mark (Erythromycin Stearate, Abbott)

*Q 15

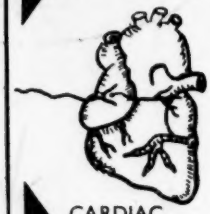
CONTROL



VIRTUALLY WITHOUT SIDE EFFECTS

NO BLURRED VISION

NO DRY MOUTH



NO CARDIAC EFFECTS

NO URINARY RETENTION

A NEW ANTISPASMODIC AGENT

It has been demonstrated in animal experiments that the new compound bentyl hydrochloride* (beta-diethylaminoethyl l-cyclohexylcyclohexanecarboxylate hydrochloride) possesses both a parasympathetic depressant (atropine-like) and musculotropic (papaverine-like) action on the smooth musculature of the gastrointestinal tract. Hock administered this drug to 67 patients with such gastrointestinal complaints as functional bowel distress, peptic ulcer, chronic pancreatitis and gastroenteritis. The usual dosage was 10 or 20 mg. three or four times daily, with or without 15 to 30 mg. of phenobarbital. The drug was well tolerated in 66 of 67 patients and was stopped in only one patient who showed intolerance to other drugs also. Bentyl hydrochloride appears to be more effective than the belladonna group of antispasmodics and has the advantage of virtual freedom from cycloplegia, mydriasis and xerostomia.

Extract from The Journal of the American Medical Association, Vol. 145, No. 17.

* BENTYL

Bentyl hydrochloride is a Product developed by the MERRELL LABORATORIES, established in 1828 in America. It is marketed in the United Kingdom under the name of MERBENTYL, and is available both plain and with Phenobarbitone.

MERBENTYL

Merbentyl and Merbentyl with Phenobarbitone are each available in bottles of 50 and 250 tablets. Each tablet of Merbentyl contains 10 mg. of Dicyclomine Hydrochloride. Tablets of Merbentyl with Phenobarbitone contain 10 mg. of Merbentyl and 15 mg. of Phenobarbitone. Literature and sample available on request.

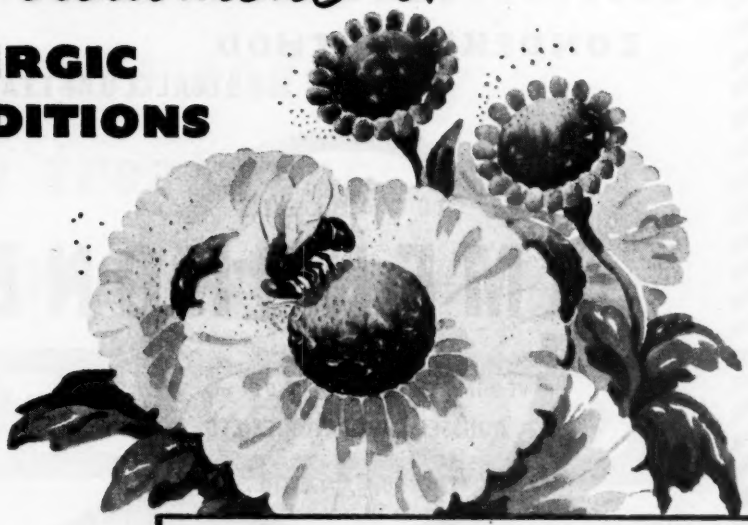
MERBENTYL REGD.

Distributed in the United Kingdom by
RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Company, London.

Merrell

For treatment of

ALLERGIC CONDITIONS



Synopen

REGD. TRADE MARK

Sufferers from allergic diseases, previously denied many pleasurable pastimes, particularly in the summer months, can, since the introduction of anti-histamine therapy, enjoy a more normal existence.

Owing to its favourable therapeutic index and notable freedom from side effects, especially absence of drowsiness, Synopen is the anti-histamine of choice.

Synopen is indicated for all allergic conditions, and may be administered safely to those who must necessarily continue their normal occupations during treatment.

Synopen tablets containing 25 mg. of N-dimethylaminoethyl-N-p-chlorbenzyl-α-aminopyridine hydrochloride are available in packs of 20, 100 and 200, and are prescribable on N.H.S. Form E.C.10.

Literature and Sample available on request

Geigy

PHARMACEUTICAL LABORATORIES GEIGY LTD.

Rhodes, Middleton, MANCHESTER.

PH. 60

ZONDEK'S METHOD

MEDICAL CURETTAGE

20 TABLETS

AMENORONE

Each tablet contains
Ethisterone 10 mg.
Ethinyl Oestradiol 0.01 mg.

ROUSSEL LABORATORIES LTD.
847 Harrow Road,
London, N.W.10

4 TABLETS DAILY FOR 5 DAYS

FOR

AMENORRHOEA

AND OTHER MENSTRUAL DISORDERS

Box of 20 tablets intended for a 5-day course. Also bottles of 100 and 500.

BASIC N.H.S. COST

Dispensed from packs of :	500	100	20
Price to Chemist for 20 tablets :	7/4	8/4	9/6

ROUSSEL LABORATORIES LTD
8413 847 Harrow Road, London, N.W.10 LADbroke 3608

For safe and easy treatment of hypertension

RAUWILOID

Standardized alkaloids of

RAUWOLFIA SERPENTINA

available as 2 mg. tablets

RAUWILOID is

hypotensive

bradycardic

sedative

and is virtually free from side effects

Detailed literature and bibliography gladly supplied on request

"Rauwiloid" is a Registered Trade Mark

Regd. Users:

RIKER LABORATORIES LTD

LOUGHBOROUGH, LEICS.

AN ORIGINAL PRODUCT OF RIKER RESEARCH

The patient leads an ACTIVE Life

There are many good reasons why clinicians find Liver Injection U.S.P.-20 micrograms *Lederle* so outstandingly successful in the maintenance treatment of pernicious anaemia. The product is made solely from beef liver by a process which provides maximum concentration of the anti-pernicious anaemia factor and removes undesirable substances—resulting in reduction of solids and increased potency.

Injections cause a minimum of pain and allergic reactions yet exert optimum therapeutic effect, permitting the patient to lead an active working life and to enjoy his leisure hours.

Reported as "significantly more potent" than other extracts,* the Lederle preparation has a vitamin B_{12} content of 20 micrograms per c.c. (assayed microbiologically). Apart from its *specific* use in pernicious anaemia, the extract is being increasingly adopted as a general hepatic and metabolic stimulant.

Lancet (1950) 1, 1064.

Liver Injection U.S.P.

Boxes of 3 x 1 c.c. vials **20 Micrograms**

LOOK TO Lederle FOR LEADERSHIP

LEDERLE LABORATORIES DIVISION

Cyanamid Products Ltd.

BUSH HOUSE • ALDWYCH • LONDON, W.C.2 • TEMPLE BAR 5411

Extended range of A.B. Insulins

Whether the individual requirements of the diabetic patient call for prompt action or prolonged effect, confident control of carbohydrate metabolism can be achieved with one of the extended range of A.B. Insulins.

INSULIN A.B. The original unmodified type. Immediately effective but acting for a relatively short time.

5 and 10 c.c. vials (20, 40 and 80 units per c.c.)

GLOBIN INSULIN (with zinc) A.B. A combination of insulin and globin which has a slower and more prolonged action than Insulin A.B.

5 c.c. vials (40 and 80 units per c.c.)

PROTAMINE ZINC INSULIN A.B. A suspension of insulin precipitated by protamine which is absorbed slowly, thus delaying the initial action and prolonging the effect for 12 hours and upwards.

5 c.c. vials (40 and 80 units per c.c.)
10 c.c. vials (40 units per c.c.)

I.Z.S. INSULIN ZINC SUSPENSION A.B.
10 c.c. vials (40 and 80 units per c.c.)
Duration of action—24 hours.

INSULIN ZINC SUSPENSION (Amorphous) A.B.
10 c.c. vials (40 and 80 units per c.c.)
Duration of action—about 12 hours.

INSULIN ZINC SUSPENSION (Crystalline) A.B.
10 c.c. vials (40 and 80 units per c.c.)
Duration of action—up to 36 hours.

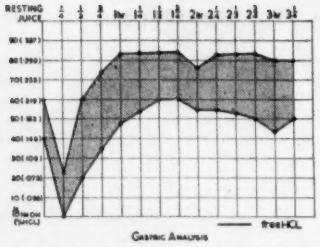
A|B TRADE MARK

A.B. Insulins

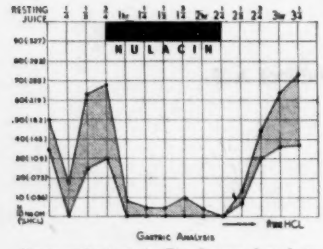
Joint Licensees and Manufacturers
ALLEN & HANBURYS LTD LONDON E.2 · **THE BRITISH DRUG HOUSES LTD** LONDON N.1

Nulacin

MILK-ALKALI DRIP THERAPY WITHOUT INCONVENIENCE OR DISCOMFORT



Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

HERETOFORE, a continuous state of maintained gastric anacidity has been possible only with hospitalization and discomfort to the patient.

Now, NULACIN will give your patients the relief and comfort of intra-gastric milk-alkali drip therapy without hospitalization, and whether they are at home or at work.

INDICATIONS

NULACIN tablets are indicated whenever neutralization of the gastric contents is required:—in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

Beginning half-an-hour after food, a NULACIN tablet should be placed in the mouth and allowed to dissolve slowly. During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.

NULACIN tablets are not advertised to the public and have no B.P. equivalent. May be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol. Menth. Pip.q.s.

BIBLIOGRAPHY:

The Control of Gastric Acidity, Brit. Med. J., 180-182, 26th July, 1952

Medical Treatment of Peptic Ulcer, Med. Press, 195-199, 27th February, 1952

The Effect on Gastric Acidity of "Nulacin" Tablets, Med. J. Aust., 823-824, 28th November 1952

Control of Gastric Acidity by a New Way of Antacid Administration, J. Lab. Clin. Med., 42:955 (1953)

Further Studies on the Reduction of Gastric Acidity, Brit. Med. J., 183-184, 23rd January, 1954

NULACIN is available from Horlicks in U.K. · U.S.A. . CANADA (as Nulactin) AUSTRALIA · NEW ZEALAND · CEYLON MALAYA . INDIA and is also distributed in most other countries.

HORLICKS LIMITED

Pharmaceutical Division, SLOUGH, BUCKS.

NEW..

for the eradication of Pseudomonas Infection in Otitis

'AEROSPORIN' brand Otic Solution, which is now available, is a specially formulated preparation of 'Aerosporin' brand Polymyxin B Sulphate, an antibiotic highly and rapidly bactericidal to many gram-negative organisms and pre-eminent against *Pseudomonas pyocyanea.*

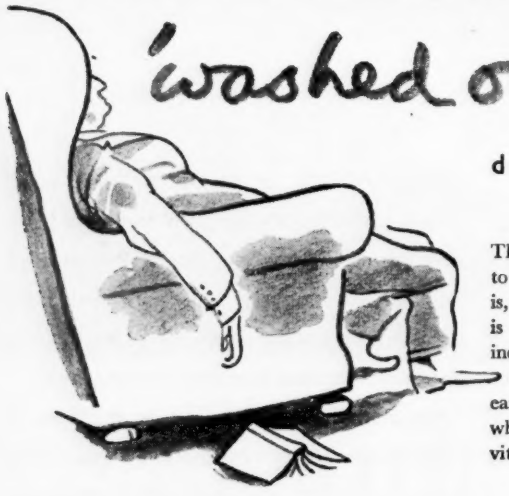
'Aerosporin' Otic Solution is therefore of specific value in otitis externa and chronic otitis media due to *Ps. pyocyanea (Ps. aeruginosa).* The occurrence of this organism has become more apparent since the introduction of penicillin therapy, which has little or no effect on the gram-negative organisms or the fungi present in otitis. There is evidence that the fungi also are susceptible to 'Aerosporin'. Bacterial resistance to 'Aerosporin' has not been reported.

'Aerosporin' Otic Solution is markedly hygroscopic and has a low surface tension, giving optimal conditions for an adequate concentration of the antibiotic at the site of infection. It is issued in bottles of 10 c.c. with dropper at 9/6, subject to usual discount. Each c.c. contains 10,000 units of polymyxin B sulphate.

'Aerosporin' BRAND

Otic Solution

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* LONDON



'washed out'

defines a common deficiency

The water-soluble vitamins are not stored by the body to any great extent. Any excess above immediate needs is, in a real sense, 'washed out' from the system; so it is easy for a deficiency to arise—showing itself in indefinite lassitude and fatigue, often accompanied by sub-clinical skin and digestive disorders. Just as easily, the condition can be corrected with Nicorbin, which presents the four most important water-soluble vitamins in convenient tablet form.

Q: How to avoid the glossitis that sometimes follows treatment with oral antibiotics ?

A: Advise 3 to 6 Nicorbin Tablets, three times a day.

NICORBIN *Trade mark* **tablets**

In bottles of 50 and 500

Each tablet contains: aneurine hydrochloride (vitamin B_1), 1 mg.; riboflavine, 1 mg.; nicotinic acid (P.P. factor), 10 mg.; ascorbic acid (vitamin C), 25 mg.

GLAXO LABORATORIES LIMITED, GREENFORD, MIDDLESEX BYRon 3434

The complete answer for macrocytic anæmias

Clinical experience over a decade has established that the administration of Anahæmin constitutes the most effective form of treatment for pernicious anæmia.

Anahæmin produces, with small and comparatively infrequent doses, a prompt and satisfactory erythropoiesis in patients in relapse, it ensures the maintenance of a normal erythrocyte level in patients in remission and is effective in preventing the onset of subacute combined degeneration of the cord. Anahæmin has also been found to be of value in the treatmentof herpes zoster and post-herpetic neuralgia. The suggested dosage is 4 ml. on alternate days until relief is obtained.

'ANAHÆMIN'

Anahæmin is available in:

1 ml. ampoules, Boxes of 6 at 11/4, 25 at 43/4
2 ml. ampoules, Boxes of 6 at 19/–, 25 at 74/–
Vials of 10 ml. at 14/8 and 25 ml. at 35/10
Basic N.H.S. prices

Literature and specimen packings are available to members of the Medical Profession on request

THE BRITISH DRUG HOUSES LTD. (Medical Department) LONDON N.I

ANAH/E/117

THE SECRETIONS OF THE BRAIN *

RELATION OF HYPOTHALAMUS TO PITUITARY GLAND

S. ZUCKERMAN
C.B., M.A. Oxfd, M.D. Birm., D.Sc. Lond., F.R.S.
PROFESSOR OF ANATOMY, UNIVERSITY OF BIRMINGHAM

(*Concluded from p. 743*)

The New Secretions of the Brain

THE PITUITARY HORMONES

The story re-opens in 1895 with the demonstration by Oliver and Schafer that the blood-pressure of an animal rises after the injection of a " concoction " of the pituitary. Howell (1898) soon showed that the effect was due to the posterior as opposed to the anterior lobe of the gland. A few years later Magnus and Schafer (1901) found that the posterior-lobe hormone also has a diuretic/antidiuretic action. And soon afterwards, Dale (1906, 1909) demonstrated that posterior-lobe extracts had an oxytocic action. Concurrently, numerous clinical observations indicated very clearly that the anterior part of the pituitary also had important hormonal functions (see Teel and Cushing 1930). The proof of this was provided in the '20s by the brilliant experimental studies of Herbert M. Evans, Zondek, Aschheim, and others too numerous to mention, which showed quite clearly that the anterior lobe of the pituitary plays a vital part in the control of growth, in the regulation of reproductive processes, and in the maintenance of certain other endocrine organs such as the adrenal cortex.

The histological structure of the posterior lobe did not encourage any of the earlier workers to believe that the active principle which could be extracted from it was elaborated within it. Herring (1908, 1914), whose name is now applied to the hyaline bodies often seen in the pituitary stalk, held that the posterior-lobe hormone was, in fact, produced by the cells of the pars intermedia, and that it passed back into the pars nervosa and up the pituitary stalk. His interpretation was seized upon by many other workers, and particularly by Harvey Cushing (e.g., Cushing and Goetsch 1910, Cushing 1933). Cushing's belief was that the posterior-lobe hormone not only entered the blood-stream, but that after making its way up the pituitary stalk it passed through the ependymal lining of the third ventricle and so entered the cerebrospinal fluid. Gradually, however, opinion changed. The conventional view today is that there are specific parenchymatous secretory cells in the neurohypophysis, and that these cells are responsible for the secretion of the posterior-lobe hormones (see Gersh 1939).

About the secretory powers of the anterior lobe there never was any doubt. Its structure was clearly glandular, and the only difficulty was to reconcile its apparent cytological simplicity with the complexity of its hormonal functions.

By the time we were fairly clear about the distinction between posterior and anterior lobe function, the infundibular region of the brain again entered the picture. It did so first as a result of a series of studies started by Karplus and Kreidl in 1909, which showed that stimulation of the hypothalamus led to a number of autonomic effects (e.g., changes in heart-rate, and salivation). These observations were followed in 1913 by Camus and Roussy's demonstration that an adiposogenital syndrome could develop as a result of experimental hypothalamic lesions. As our knowledge continued to grow, it became abundantly clear that in some mysterious way the hypothalamus—the infundibular region of the Ancients—controlled or modulated the endocrine activity of both the anterior and posterior lobes of the pituitary. Once again the question was, How ?

This time, however, the problem was both more specific and more complicated. First, it was quite clear that the pituitary consisted mainly of two quite separate endocrine structures—an anterior lobe,[13] and a posterior lobe.[14] Secondly, by now there was precise knowledge of the nature of nervous action ; if the pituitary stalk was not hollow, at any rate it consisted largely of the axons of hypothalamic nerve-cells, which provided an anatomical basis for whatever cerebral control there was of pituitary function (see fig. 3). And thirdly—and most important—answers could no longer depend on speculation based on dogma, however hallowed ; the hard facts of observation and experiment were needed.

HYPOTHALAMIC CONTROL OF THE POSTERIOR PITUITARY

The first problem for which a solution seemed to have been found was the control exercised by the hypothalamus over the secretion of antidiuretic hormone. The

13. More correctly designated the pars distalis of the adenohypophysis, of which the other two parts are the pars intermedia and pars tuberalis.
14. Now defined as the processus infundibuli of the neurohypophysis, whose two other parts are the infundibular stem or stalk, and the median eminence of the tuber cinereum—which includes the infundibular bulb or infundibulum.

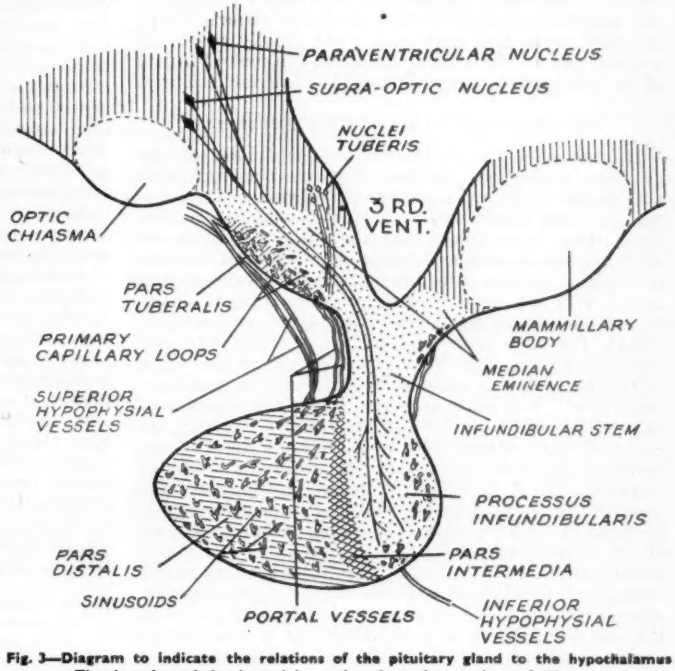


Fig. 3—Diagram to indicate the relations of the pituitary gland to the hypothalamus The three hypothalamic nuclei mentioned are shown schematically

* The seventh Addison Memorial Lecture, delivered at Guy's Hospital, London, on Dec. 16, 1953.

explanation seemed simple enough (Fisher et al. 1938). All levels of the neurohypophysis are connected with the terminations of the axons of cells in the nuclei supraopticus and paraventricularis of the hypothalamus (particularly the former). Presumed secretory cells ("parenchymatous glandular cells") are present in the median eminence and infundibular stem, as well as the infundibular process (Gersh 1939). The whole neurohypophysis, including, as it does, part of the floor of the third ventricle, is thus concerned in the secretion of hormone, and all of it is under the control of the hypothalamus. Sever the pituitary stalk, and the part of the neurohypophysis distal to the section atrophies completely—owing to the interruption of the trophic influence of the hypothalamus—and no longer can any hormone, antidiuretic, pressor, or oxytocic, be extracted from it. Destroy the nuclei supraopticus and paraventricularis and remove that control completely, and the whole neurohypophysis involutes; and diabetes insipidus supervenes, owing to the cessation of secretion of antidiuretic hormone. Or completely divide the supraoptico-hypophysial tract, and the cells of the nucleus supraopticus degenerate. The reason why hypophysectomy itself is only occasionally followed by diabetes insipidus is also straightforward; the operation very rarely removes all of the neurohypophysis, and the cells of the part which remains hypertrophy to compensate for the loss of the rest.

These observations and interpretations seemingly provided all that could be asked for in trying to understand the control exercised by the hypothalamus on the diuretic/antidiuretic balance. And since the hypothalamus is a major autonomic motor centre which is linked, as far as one knows, with all the afferent zones of the brain, they also made it possible to understand how various forms of afferent stimulation are tied up with processes in which posterior-lobe hormones are involved. Thus they help to provide an explanation for the effects of emotion on water diuresis (e.g., Verney 1947, Noble et al. 1950, Taylor and Noble 1950), and also to understand the nature of the nervous pathways concerned in the reflex stimulation of milk discharge (Harris 1951). In short, while one might not know exactly how it all worked, there could be no doubt about the general nature of the link between the brain and the posterior pituitary.

HYPOTHALAMUS AND ANTERIOR PITUITARY

If the connection with the posterior lobe of the pituitary seemed, on the face of it, clear enough, that with the anterior was anything but obvious. Here one goes on being confronted by a most bewildering puzzle. First, there is no doubt that the anterior lobe of the pituitary regulates several bodily processes, and that the timing and intensity of its different physiological activities accord with the steps of those processes; or, to put it in the teleological terms used by Bayliss and Starling (1904), that the secretions of the anterior lobe are regulated by the needs of the body. We know that some of this regulation is effected by hormonal or metabolic interaction. For example, when, under the stimulus of the gonadotrophic hormone of the anterior pituitary, an excess of œstrogen is secreted by the ovaries, the pituitary becomes inhibited, and the gonadotrophic stimulus weakens. Or if we follow Wilhelmi (1948), when the peripheral carbohydrate level falls, adrenocorticotrophic hormone (A.C.T.H.) is released from the pituitary, as part of the mechanism concerned in stabilising peripheral carbohydrate levels; then, as an effect secondary to the subsequent secretion of hormone by the adrenal cortex, gluconeogenesis occurs and the level of blood-sugar rises. But some regulation is undoubtedly of a more direct nervous kind, and is presumably mediated by the hypothalamus. For example, it has been shown (Harris 1948a) that in an animal such as a rabbit, which normally ovulates after the stimulus of mating, direct unipolar or bipolar stimulation of the hypothalamus can result in rupture of the ovarian follicles, provided the experiment is done during the œstrous phase of the cycle. Presumably normal mating also starts a train of nervous stimulation which culminates in the firing of the relevant hypothalamic neurons. Another example is the anœstrous ferret, which becomes œstrous in the winter months if it is exposed to additional light. While the main visual centres of the brain are apparently not involved (Le Gros Clark et al. 1939), the primary receptor for the response is the retina (Thomson 1951, 1954), and the stimulus is presumably also relayed to the hypothalamus before it activates the pituitary. And to take a last but perhaps now more familiar, even if more debatable, example, a painful stimulus leads to a reflex release of A.C.T.H. from the anterior pituitary; certain workers (e.g., de Groot and Harris 1950, Fortier 1952) believe that the hypothalamus is once again an intermediate station for the response.

But—and here is the essential difficulty—few workers believe that the glandular cells of the anterior lobe obtain their secreto-motor innervation from the hypothalamus (see Harris 1948b),[15] or that there is any other kind of secreto-motor innervation (e.g., via nerve-fibres along the pituitary blood-vessels).

How, then, are the "reflex" responses of the anterior pituitary controlled?

THE PITUITARY-PORTAL VEINS

The possibility which is now attracting the greatest attention is that the critical anatomical link between the hypothalamus and anterior pituitary is provided by the very axial-stalk vessels which Lieutaud described nearly two hundred years ago. The part they played then was as a channel for the pituita; they derive their present importance from the possibility that they convey a so-called "chemotransmitter" from the hypothalamus to the pituitary.

We owe their rediscovery, and their first fairly complete description, to Popa and Fielding (1930a and b, 1933), who gave an account of what they were the first to call the hypophysio-portal system of veins. According to these workers, the axial-stalk veins collect blood inferiorly from the pars distalis (anterior lobe) and pars intermedia, as well as from the pars tuberalis and pars posterior, and then ascend the stalk as parallel veins "which after a short course, acquire thick neuroglia sheaths." Popa and Fielding believed that superiorly, beneath the infundibular recess of the third ventricle, the vessels lost their neuroglia wrapping, and formed a network of very fine channels which they describe as a secondary distributing net. Popa and Fielding were persuaded of the correctness of Cushing's opinion about the direction of flow of the posterior-lobe hormone, and it was their view that the current in the portal vessels was from below upwards, and that colloid material was transported from the pituitary to the hypothalamus, where in fact they demonstrated it histologically, as had Collin (1928) before them. Since then the contrary view has gained ground, particularly as a result of the researches of Wislocki and King (1936), Green and Harris (1949), and Barrnett and Greep (1951a); and most—but not all—observers now believe that the direction of the blood is from above downwards. The secondary distributing net of Popa and Fielding has thus become the primary net, comprising a dense mesh of capillary loops in the pars tuberalis, while the true secondary net is represented by the connection

15. The early death in 1952 of Vazquez-Lopez, the most recent protagonist of the opposite view, has unfortunately removed from the scene one who might have helped solve the problem, which has clearly to be settled before we are going to reach anything like a final answer to the question of the control of anterior pituitary function.

of the main portal vessels with the sinusoids of the pars distalis (see fig. 3).[16]

As already indicated, it was the disbelief in the existence of any nervous connection that made it necessary to consider the possibility that the pituitary-portal veins are in some way involved in the presumed control which the hypothalamus exercises over the anterior lobe of the pituitary. The hypothesis that has been advanced (Harris 1948b) is that some unknown "chemotransmitter" is liberated, as a result of nervous stimulation, in the vicinity of the portal vessels, into whose primary capillary loops it passes. The "hormone" then passes down the longitudinal channels on the stalk into the sinusoids of the anterior lobe, and is so able to influence the secretory cells of the pars distalis.

In the light of Harris and Jacobsohn's (1952) experiments on pituitary transplantation, few could doubt that the portal vessels play some special part in the economy of the anterior lobe; for these two workers found that pituitary tissue is more likely to "take" successfully if it is transplanted under the median eminence of the brain, where the grafted tissue can come into relation with the proximal stumps of the portal vessels, than anywhere else. On the other hand, the attractive theory of which the portal vessels constitute the central feature is essentially based on what may be called purely negative considerations. Indeed, the chemotransmitter or chemotransmitters had to be conjured into existence only because without them we could seemingly explain nothing about the mechanisms involved. Moreover, the theory is hardly as precise as the facts which it has to explain. The anterior lobe of the pituitary controls many functions; and we have either to suppose that the gland is differentially activated by different kinds of chemotransmitter, or that, once activated by a single stimulus, the gland of itself adjusts its secretions according to the needs of the body. If it is the former which is implied, we are well beyond the area of fact. If it is the latter, the hypothesis merely transfers the critical problem we are trying to understand—how the reflex functions of the pituitary are controlled—from the hypothalamus to the pituitary itself.

THE PITUITARY-PORTAL HYPOTHESIS

The specific evidence which it has been suggested (Wingstrand 1951a,[17] Harris 1952, Mazzi 1952) supports the idea that the pituitary-portal vessels are the controlling link between these two structures, derives partly from observations on the effects of direct stimulation of the hypothalamus, partly from studies of the behaviour of pituitary grafts, and partly from studies of the effects of section of the pituitary stalk.

The first line of evidence, however, merely indicates that experimental stimulation of the hypothalamus can lead to responses such as ovulation—without in any way showing what the link is between the hypothalamus and the anterior pituitary. Correspondingly little can be drawn from such evidence as is available about the behaviour of pituitary grafts. The genetic relationship of host to donor has not always been as close as is desirable in experiments of this kind, and the results in some cases reflect the fact that very little pituitary tissue has survived. All but a few reports also imply that the grafts do not maintain full reproductive function. On the other hand, it seems to be agreed that a transplant of anterior pituitary tissue in the anterior chamber of the eye will release A.C.T.H in response to a suitable stimulus—in spite of the fact that it is completely separated anatomically from the hypothalamus.

The information that is available from experiments in which the pituitary stalk has been sectioned is also equivocal, some observers reporting very little, if indeed any, and others considerable, derangement in processes which are under the control of the anterior pituitary (e.g., reproduction). Harris (1952) has suggested that in those instances in which the operation has not interfered with reproductive function, the pituitary-portal vessels have regenerated; and on the basis of work carried out in collaboration with Jacobsohn (1952) he has concluded that the anterior pituitary does not function properly except when the pituitary-portal system is intact. An alternative explanation of the conflicting results of stalk section reported by different investigators is that the operation almost inevitably divides one or more small vessels supplying the gland, with variable amounts of resulting and lasting damage due to infarction (Greep and Barrnett 1951).

Studies in my own laboratory (Thomson and Zuckerman 1953) suggest that complete division of the pituitary stalk in the female ferret does not necessarily interfere with the presumed relay of impulses to the pituitary from the hypothalamus—even when no vascular connection of any kind has re-formed between the gland and the infundibular region. The particular response studied was the reaction of the anœstrous animal to additional light in the winter months. The operations were carried out in the summer months, and a piece of waxed paper inserted between the proximal and distal parts of the stalk. Most preparations were defective for one or other of several technical reasons—usually movement of the paper between the time of the operation and the subsequent autopsy. In two, however, there was no question but that the animals reacted to light despite either destruction of the median eminence and disappearance of the primary capillary net, or complete separation of the pituitary from the hypothalamus, determined from serial sections of a block consisting of the sella turcica, the pituitary, and the overlying part of the brain. In one animal a three-dimensional reconstruction showed that the paper was still in position, that the processus infundibuli had atrophied completely and that the proximal stump of the stalk was attached to the scar tissue surrounding the plate of paper. The pars distalis, which the paper completely separated from the base of the brain, showed no histological abnormalities, and was normal in size. There was no vascular connection of any kind between it and the region of the median eminence.

This observation disposes both of the view that the integrity of the pituitary-portal veins is essential for the "reflex" activation of the anterior pituitary in responses of the kind that we are considering, and of the generalisation that the anterior lobe of the pituitary will not function properly unless the vessels are intact. It is also incompatible with the idea that the signal which triggers the pituitary of the anœstrous ferret to produce gonadotrophin is some chemotransmitter that is elaborated in the hypothalamus, and which passes down the pituitary-portal veins. On the other hand, it does not exclude the possibility that there is a chemotransmitter(s), or, given that one exists, that this is conveyed to the pars distalis via the systemic blood-stream. Nor, needless to say, do our observations mean that what applies to the ferret necessarily represents general vertebrate physiology. In many birds, for example, all or most of the arterial blood which passes to the pars distalis traverses the capillary loops of the primary capillary net of the portal system, and in the species concerned these vessels are presumably

16. Popa and Fielding (1933) knew that other observers before them had seen the hypophysio-portal vessels. They do not, however, appear to have known about de Bordeu's controversy with Lieutaud, since the earliest of their references is to Lothringer (1886), who described an interminglings of epithelial cells with large vessels at the point where the pars distalis and pituitary stalk come together.

17. Wingstrand, while adhering to the pituitary-portal hypothesis, recognises that "the decisive proof of the route of the impulses from the hypothalamus to the pituitary is lacking."

essential to normal pituitary function (Wingstrand 1951a and b, Benoit 1951).

Our observations do, however, underline the critical consideration that what matters in experiments in which the stalk is divided may well be the extent to which the anterior pituitary suffers as a result of infarction, following on the interruption of its ordinary blood-supply, or from some other cause. In the rat Greep and Barrnett (1951) and Barrnett and Greep (1951b) found that immediately after the operation the reproductive system becomes hypoactive to an extent which varies with the amount of damage suffered by the anterior pituitary, but that it may then recover slowly, although rarely completely. Recovery is, however, independent of restoration of the pituitary-portal vessels. Tang and Patton (1951), on the basis of experiments on male guineapigs, go a step further and state that there is practically no evidence of impairment of anterior pituitary function after stalk section, and that this is so despite no regeneration of the stalk vessels. In ferrets whose pituitary stalks are divided, the anterior lobe is occasionally normal in size, and at other times smaller and changed in microscopic appearance. In the former, but not the latter, instance the operation has presumably damaged some small vessels supplying the gland.

The fact is that no two operations on the pituitary stalk of an animal are likely to produce precisely the same type of lesion—regardless of the intention of the investigator. Circumstances make it difficult to standardise the operation, and variation in minute anatomical disposition between animals cannot be counterbalanced by visual control. Moreover, unfavourable though the position is with mammalian species used in experiments on the stalk, it appears to be worse with birds, where the main afferent blood-supply to the pars distalis is, apparently, via the portal vessels. Experiments may show that anterior-lobe function is not the same after division of the portal vessels, and one may consequently draw the conclusion that some local chemotransmitter is involved (Benoit 1951). A more obvious interpretation would, however, be that an ischæmic anterior lobe cannot function properly.

In evaluating experiments of the kind we are discussing, it is clearly not enough, therefore, to be told that the stalk was completely divided. Where pituitary hypofunction supervenes, we also need to decide whether the effects observed were not due to unintentional damage to the pars distalis, or even to damage to adjacent parts of the hypothalamus.

While our observations on the ferret conflict with the pituitary-portal hypothesis, they fail to take us a single step closer to an understanding of the precise way the response to light in this animal is, in fact, mediated. And unless we are prepared to overlook the critical lack of those facts which should be there if we are to understand the physiological mechanism involved, the same unfortunate conclusion applies, in my judgment, to all experiments which seem to show how the hypothalamus is linked to, and is involved in, the " reflex " activation of the anterior lobe.

SECRETIONS OF THE HYPOTHALAMUS

It is paradoxical that while the " chemotransmitters " which activate the anterior lobe seem so illusory, an increasing number of researches in recent years are nevertheless leading to the view that hypothalamic neurons do, in fact, secrete hormones. These, however, are concerned with the neurohypophysis—not the adenohypophysis. I have already referred to the fact that Collin, as well as Popa and Fielding, had noted that so-called colloid inclusions could be found in the hypothalamus. E. Scharrer independently made the same observation, and in 1928 published the first of a series of papers concerned with the peculiar secretory appearance of cells in the nuclei supraopticus and paraventricularis of the vertebrate hypothalamus, and with their close relationship to capillaries. He argued convincingly that the histological appearance of neurosecretion had a functional significance, and represented neither post-mortem changes, nor degeneration phenomena, nor fixation artefacts ; and also that the colloid in the hypothalamic nuclei had not migrated into the brain from the pituitary, as had been suggested by Collin. Few, however, seem to have been convinced, and Scharrer, as he himself states (Scharrer and Scharrer 1940) failed to throw further light on the problem by experimental methods. It was, as he points out, difficult to know what pharmacological tests to apply to extracts of the two hypothalamic nuclei. At the same time the contention of Ranson and his colleagues that the hypothalamus could not take over the function of the neurohypophysis, when the latter was ablated, obviously affected views on the possible significance of the hypothalamic secretion.

The position was transformed overnight in 1949, when Bargmann discovered that Gomori's chrome alum-hæmatoxylin-phloxine stain could be very effectively used to demonstrate cytoplasmic inclusions not only in the neurons of the nuclei supraopticus and paraventricularis, but also throughout the length of their axons. His observations have now been confirmed by many workers, including Scharrer and his colleagues. No neurons other than those of these two nuclei and of the mammillo-infundibular nucleus are chromehæmatoxophil [18] (Smith 1951). At the same time, experiment has suggested very strongly that the neurohypophysis itself is not a primary secreting organ, but that the posterior lobe hormones (the pressor, antidiuretic, and oxytocic principles) are elaborated by the neurons in the nuclei supraopticus and paraventricularis, and also possibly by their axon terminals in the neurohypophysis (e.g., Bargmann and Scharrer 1951, Hanström 1952a and b). For example, it has been shown (Hild 1951, Stutinsky 1951a) that when the pituitary stalk is tied or cut, the part of the neurohypophysis distal to the ligature rapidly becomes depleted of material which stains with Gomori's alum-hæmatoxylin, whereas so-called Gomori-positive material accumulates within the axons immediately proximal to the ligature. Corresponding observations, which seem to indicate that there is a flow of some substance from the cell body down the axon, have been made in invertebrates in which " neurosecretion " has for long been accepted as a normal phenomenon. For example, Ellen Thomsen (1954) has used a single strand of silk from the silkworm to ligature the axons coming from a few secretory neurons in the brain of the fly, and has demonstrated the damming-back of some substance immediately proximal to the knot. Yet another demonstration of this " flow " has been provided by Drager (1950), who removed the pituitary from a certain species of snake and filled the empty sella turcica with fibrin-foam. Two to four weeks later, when the animals were killed, spherical droplets with staining properties identical with those of the granules in the hypothalamic nuclei, were found in the fibrin-foam.

Transplantation experiments also suggest that the processus infundibuli does not secrete the hormone it contains. Thus, Stutinsky (1950, 1951b) transplanted the " gland " to the capsule of the kidney, and found that in its new position it rapidly becomes depleted of Gomori-positive material which, on the other hand, piled up in the proximal part of the neurohypophysis which was not removed. A corresponding observation is based on the

18. The following terms have been used to describe cells which stain electively with chrome alum-hæmatoxylin : Gomori-positive ; C.H.P. positive ; chromehæmatoxophil. Smith states that the axons of the mammilo-infundibular nucleus mingle with those of the two other nuclei which react to the stain.

fact that neurosecretory granules disappear from the hypothalamus and neurohypophysis when animals are kept thirsty. If the pituitary stalk is cut in such animals, which are then allowed to drink ad lib, granules soon reappear proximal to the cut, but not in the part below (Hild 1953). Moreover, the granules first reappear in the cell bodies themselves, as opposed to the axons (Ortmann 1951).

Valuable evidence has also been obtained in a series of experiments carried out on large groups of Alsatian dogs by Zetler (1953) and Hild and Zetler (1953). These workers have found that the concentration of posterior lobe hormone in the anterior hypothalamus [19] varies, in parallel with that in the processus infundibuli, according to the state of hydration and dehydration of the body. They have also shown that, whereas the concentration of posterior lobe hormone is much higher in the normal processus infundibuli than it is in the hypothalamus, the reverse is true after the pituitary stalk is tied. The concentration of hormone distal to the ligature rapidly falls, while that in the hypothalamus increases. Zetler and Hild have also provided evidence that the substance which has an affinity for Gomori's chrome alum-hæmatoxylin is almost certainly not the active hormone, but some carrier material. This observation is interesting in view of the recent synthesis by du Vigneaud (1953) of polypeptides with the properties of posterior lobe hormones.

The general conclusion to which all these newer studies are pointing is that the posterior lobe itself is little more than a storage organ for hormones produced in hypothalamic nuclei. On the other hand, Bodian (1951), in a very careful reassessment of the histological structure of the neurohypophysis of the opossum, holds that, while this conclusion is in general true, the terminals of the axons in the tractus hypophysius may also be involved in the process of secretion. Bodian believes that "the morphological complexity of the nerve terminals becomes more readily rationalised as a mechanism for serving to increase the ratio of cell surface to cell volume, and perhaps thus favoring an enhancement of the secretory process in the pars nervosa, as compared with the hypothalamic nuclei." He also believes that the pituicytes (Gersh's parenchymatous secretory cells) are adapted so as to bring the nerve-fibre terminals into closer relationship with the blood-vessels which intervene between the lobules of the processus infundibuli.

The idea that the axon terminals may play a part in the secretory process can be related to some recent observations of Vogt (1953). This worker has found that extracts of the anterior hypothalamus have the same ratio of pressor to antidiuretic activity as characterises true posterior-lobe extracts, but that oxytocic activity is relatively very low. She has, therefore, suggested that the "molecule" of posterior-lobe hormone secreted by the anterior hypothalamus is either modified as it travels down into the processus infundibuli, or that the latter actually elaborates oxytocin. Either way, this experimental observation could be taken as according with Bodian's anatomical view that the nerve terminals play some active part in the production of the posterior-lobe hormone.

EVIDENCE FOR POSTERIOR-LOBE SECRETION

With all these new findings and new ideas coming forward, it is obviously essential to reconsider the facts which sustain the conventional view that the neurohypophysis itself is a secretory organ. As the history of the subject shows (compare, for example, van Dyke 1936, with his 1939 review of the subject), recourse can hardly be made to histology for proof that the posterior lobe is a secretory organ. Nor can we take the fact (e.g., Geiling 1935) that posterior-lobe hormones can be extracted from isolated pars nervosa tissue as indicating that the hormone is elaborated there—it might well have been produced, as the new theory suggests, in the hypothalamus. In view of this possibility, the only kind of evidence that could be taken as proof that the pars nervosa is itself a secretory structure would have to be derived from tissue-culture experiments. And even so it could be argued—if it turned out that cultures of posterior lobe do not produce hormone—that such a result was only to be expected in view of the fact that none is produced even by the posterior lobe in situ once it is released from hypothalamic control.

The evidence from tissue-culture experiments is far from convincing—in spite of the frequency with which it is cited. Geiling and Lewis (1935) prepared cultures of pars nervosa and intermedia taken from rats and mice, and allowed them to grow for up to fifty days. The pars nervosa tissue gave rise to an abundant growth of long, flat, radiating cells, and of neuroglia-like cells. The cultures were found to have both a pressor and melanophore-expanding action, but there is a suggestion, too, that the nutrient medium itself had a slight pressor effect.[20] A test for antidiuretic action was made with only one culture, and it gave no more than "some indication" of the presence of an active antidiuretic principle (Lewis 1938). What one does not learn from reports of experiments of this kind is: (*a*) how rigid the controls were; (*b*) how specific the tests were for posterior-lobe hormone [21]; and (*c*) whether such activity as was demonstrated in the culture was not due to the persistence of hormone that was there already (a point which applies regardless of the negative results of a few control cultures of connective tissue to which a solution of posterior-lobe hormone had been added).

Anderson and Haymaker's (1935) observations are equally indecisive. These authors found that there was no growth of pars nervosa elements in cultures of posterior-lobe explants taken from 8-day-old rats. The cultures were extracted after 6 days, and the melanophore-expanding principle—a product of the pars intermedia—was shown to have increased. This principle was also found in some cultures which were left for 9 or 12 days. No oxytocic hormone could be demonstrated, but some antidiuretic effect was observed, presumably in 6-day-old cultures, in three tests on dogs.

This seems to be the best evidence that can be cited about the secretory capacity of posterior-lobe explants. What little it indicates is far too inconclusive to provide any challenge to the idea that the so-called posterior-lobe hormones are, in fact, secreted by hypothalamic nuclei.

This new thesis also hardly conflicts with any of the facts—as opposed to interpretations—which Ranson and his colleagues disclosed in their classical series of researches on the cat and monkey. Both old and new theories agree that once the tractus hypophysius is interrupted, the distal part of the neurohypophysis atrophies and soon becomes free of hormone. According to Ranson's interpretation, the change is due to the interruption of a trophic and secretomotor innervation. According to the newer view, it is essentially due to the blocking of channels along which hormone flows. A more difficult issue to reconcile is the amount of retrograde degeneration that occurs in hypothalamic nuclei after division of the axons which form the tractus hypophysius. In agreement with earlier workers (e.g., Kary 1924, Lewy 1924), Ranson and his colleagues (Fisher et al. 1938) hold that all the cell bodies in the nuclei supraopticus and paraventricularis (particularly in the former)

19. Abel (1924) was the first to show that extracts of the hypothalamus had pressor and oxytocic activity.

20. It is not stated that the nutrient medium had no effect, but merely that it had no "appreciable effect on the blood-pressure."

21. On this point see van Dyke (1936); also Noble et al. (1950), Pickford (1952).

involute. Stutinsky (1951a), however, does not agree that this is so—he claims that a very large number of neurons remain functional. The difference, however, is mainly one of emphasis. Fisher, Ingram, and Ranson (1938) themselves point out that a fully developed diabetes insipidus will not occur unless the entire neurohypophysis, including the centre part of the tuber cinereum, is removed, and that " in general the intensity of the diabetes insipidus is proportional to the degree of interruption of the supraoptico-hypophysial tract." This is in fair agreement with the neurosecretory view, according to which sufficient antidiuretic hormone will be released into the blood-stream to maintain the diuretic/antidiuretic process in balance, as long as a critical amount of the two relevant nuclei is intact.

POSSIBLE CONTROL OF ANTERIOR LOBE BY POSTERIOR-LOBE HORMONE

One final question needs to be raised, even though it cannot be pursued in detail. Is there any evidence that posterior-lobe hormone—the hypothalamic " chemotransmitter " which has been revealed by all these post-war researches—can itself activate and control the many functions of the anterior lobe? The simple answer is: so far, none that stands up to close examination. For example, it is known (e.g., Nagareda and Gaunt 1951, Stutinsky et al. 1952) that strong and non-physiological doses of posterior-lobe hormone can stimulate the release of A.C.T.H. But much more will need to be revealed about this response (for example, its differentiation from a reaction due to the stress of the experiment) before we shall be in a position to evaluate it properly.

The anatomical facts that bear on the point also need close scrutiny. The median eminence in birds and in most mammals that have been studied is differentiated into an inner ependymal zone; a middle coarse-fibre layer; and an outer so-called glandular layer which is devoid of cells and which essentially consists of very fine nerve-fibres, believed to be dendrites or possibly axons of the nuclei tuberis infundibularis, set in an interstitial " colloid " (e.g., see Nowakowski 1951, 1952, and Wingstrand 1951a and b). The central fibre layer consists of the axons of the nuclei supraopticus and paraventricularis, which terminate at all levels in the stalk and infundibular process of the posterior lobe. Only this layer stains selectively with chrome-alum-hæmatoxylin, the outer glandular layer, which is in contact with the pars tuberalis and the primary capillary loops of the pituitary-portal vessels, being apparently devoid of the Gomori-positive granules which mark the flow of the posterior-lobe hormones. In some mammalian species the outer layer is reduced in thickness, and, according to Hanström (1953), is partly represented by tissue of corresponding histological appearance around the capillaries deeper in the eminentia. This occurs in certain Hyracoidea, Artiodactyla and Primates—including the orang-utan.

Gomori-positive granules have been demonstrated in the vessels of the posterior lobe (Hanström 1952a and b), but under normal conditions they apparently do not occur in those of the anterior lobe.[22] Again, the very fine fibres which have been diagnosed as nerve-fibres in the outer " glandular " zone have not been proved—at any rate in mammals[23]—to come from the nucleus tuberis infundibularis, and opposing views are held about their nature (cf. Nowakowski 1952, Hanström 1952b). Indeed, Palay (1953) failed to confirm that they were present at all in the rhesus monkey. He believes that the only nerve-fibres in the median eminence are those of the middle zone which, while they may approach the radicles of the pituitary-portal veins, never establish contact with them. Palay's view is that the vessels and nerves of the median eminence are similarly arranged in man, the cat, rabbit, guineapig, and rat (but not in the mouse), where fibres have been described as terminating on the vessels.[24]

Histological study thus provides no indication that " Gomori substance " normally can or does enter the pars distalis, and it cannot, therefore, be taken to support the view that posterior-lobe hormone activates the anterior lobe. If there is a hypothalamic chemotransmitter, which controls this lobe, its source would, by exclusion, have to be the very fine " nerve-fibres " of the outer glandular zone—in those species where they exist. There is no cytochemical evidence that this is so,[25] nor has a substance specific to this region alone been recognised pharmacologically. In short, it is not quite clear on what grounds, other than the presence of interstitial colloid, the outer zone of the median eminence has been called " glandular "—unless it merits this name because of its close anatomical association with the pars tuberalis of the adenohypophysis.

Conclusion

We can only conclude, therefore, that if the posterior-lobe hormones control the varied and varying functions of the anterior, this is not yet apparent from the evidence before us. In drawing our parallel between the present and the past, we must rest satisfied for the moment with the fact that modern science has not only established that the infundibular region of the brain does produce a vital essence, but that it has also apparently discovered the pathway by which this essence moves down the pituitary stalk into the posterior lobe of the gland. Swedenborg's " genuine or fresh " infundibular spirit and Luschka's fine tubes have thus taken real shape and meaning. So too, have the axial-stalk vessels discovered by Lieutaud two hundred years ago. But what principle, if any, these convey, and how the " reflex " responses of the anterior lobe are controlled, are two problems which still challenge our curiosity—as they have done for many years past.

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22. According to Stutinsky (1951a), when the stalk is cut and the normal flow of the granules affected, they may pile up in the outer " glandular " zone of the median eminence, and may even get into the primary capillary loops, as well as into the third ventricle.

23. Wingstrand has provided convincing histological evidence that they do so in birds. The nucleus tuberis infundibularis, which is said to be " Gomori-negative," is distinct from the nucleus mammillo-infundibularis, which is said to be " Gomori-positive " (Smith 1951). In man both are described as forming part of the " lateral hypothalamic area " (Clark 1936).

24. Both Wingstrand and Benoit refer to nerve-fibres forming loops in the outer glandular zone, and approaching the primary capillary net of the portal vessels. Wingstrand, however, has never observed the fibres terminating on the vessels.

25. As already noted, an interstitial—as opposed to intra-axonal—colloid is present in the external glandular layer, but whether this is evidence of " secretion " is debatable.

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TRIGEMINAL NEURALGIA
PATHOLOGY AND TREATMENT

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PAINS in the face may result from lesions that are demonstrable by simple examination, by special investigation, or by dissection at necropsy. On the other hand, there are varieties of continuous or periodic facial pain for which no cause can be found either in life or after death.

Trigeminal neuralgia (Fothergill's disease, prosopalgia, facial tic, or tic douloureux) is one of those maladies for which no definite pathological basis has been discovered. In diseases where a physical lesion exists, removal of the lesion usually gives relief; but the problem in conditions such as trigeminal neuralgia is entirely different, and surgical treatment consists in division at some peripheral or central level of the pain pathways concerned.

Characteristics of the Pain

The essential feature of major trigeminal neuralgia is that the pain is spasmodic and not continuous. It occurs in lightning flashes which usually are only momentary but occasionally last for as long as a few minutes. The pain is confined to the distribution of the trigeminal nerve. When the facial muscles on the affected side go into spasm during an attack, this spasm is more in the nature of "flickering" than of true contraction. In severe cases the pain may recur many times a day. Commonly there are periods of freedom, but eventual recurrence is usual—possibly after an interval of years.

The pain is initiated by any slight movement of the face, as in chewing or speaking; and a light touch—say to the side of the nose—may bring on an attack. In an attack the patient remains completely still, often holding a hand near his face, not touching it but as if for protection against any further stimulus. This unwillingness to touch the painful area is of great diagnostic significance, since in other types of facial pain the patient usually rubs his face in an attempt to get relief. The pain commonly originates from a localised area, known as the trigger-point. At the end of an attack the patient is completely free from pain, although there is always great apprehension of a further attack.

Neuropathology

No definite pathological change in the trigeminal pathways or the contiguous tissues has been found to account for the pain of trigeminal neuralgia. Organic lesions, such as acoustic neuromata and aneurysms, can of course cause pain indistinguishable from that of trigeminal neuralgia but in most cases no such lesion is present.

Harris (1926, 1937) suggested that the pain of trigeminal neuralgia is of peripheral origin, because in an untreated case there is never any objective loss of sensation or evidence of trophic disturbance. He argued that if the pain were central in origin, peripheral nerve block or neurectomy would be unlikely to give relief. In many of his cases the pain had followed difficult dental manipulations; and, because trigeminal neuralgia usually affects the lower two divisions of the trigeminal nerve (that is, the divisions that supply the teeth), he argued that the pain might be due to septic filamentous neuritis secondary to dental sepsis. He drew attention to the prevalence of right-sided neuralgia, and suggested this was possibly due to the fact that, in the right-handed majority, the teeth in the left side of the mouth were more thoroughly brushed than those on the right, with the result that sepsis was more frequent on the right side.

Dandy (1934), from his experience of operations on the cerebellopontine angle, believed that trigeminal neuralgia was due, in many cases, to irritation of the nerve by a tumour, by an aneurysm, or by loops of the branches of the basilar artery, particularly the superior cerebellar artery.

Frazier et al. (1937) concluded that the thalamocortical mechanisms were at fault and that the severe and overwhelming quality of the pain in trigeminal neuralgia was due to misinterpretation and over-estimation at the higher neural centres of a normal peripheral message. To substantiate this hypothesis, Lewy and Grant (1938) described 6 cases of trigeminal neuralgia in which necropsy revealed gross structural changes in the thalamocortical connections. They pointed out that trigeminal neuralgia arises largely at an age when degeneration of the brain is most likely; they further emphasised the absence of structural changes in the peripheral mechanisms, though Lewy and Frazier (1935) thought that the threshold for pain in the peripheral mechanisms was below normal. The high incidence of trigeminal neuralgia in patients with disseminated sclerosis may seem to support this hypothesis. On the other hand, most workers argue that cerebral degenerative changes, as judged by the clinical findings, are rare in trigeminal neuralgia.

In 5 cases of trigeminal neuralgia in which I did air-encephalography, there was no evidence of ventricular distortion or enlargement to suggest a thalamocortical lesion. In most cases there is not a single neurological sign to point to the presence of an extrapyramidal or pyramidal lesion. Moreover, on the hypothesis of imbalance of the thalamocortical mechanisms, it is difficult to explain the remissions that occur so commonly. Possibly, however, a neural message could be misinterpreted centrally without any evident structural change being present.

Wyburn-Mason (1953) implied that, as a result of distortion of the neural pathways of the first and second cervical nerve-roots, the patterns of the pain plexuses of the skin of the face became abnormal. Weddell and his associates, in a series of important papers (Weddell 1941, Weddell and Sinclair 1947, Weddell et al. 1948), have shown that in the skin pain fibres from several sources are interwoven, and only when this complex structure is intact is a pin-prick registered in the normal way. When, because of nerve damage, the normal neural pattern in the skin is replaced by a simpler meshwork, a pin-prick is registered protopathically. This possibility of alteration in the pain meshworks of the skin interested me many years ago, and in 3 instances the trigger-points of the skin were excised and were examined by the late Prof. A. F. Bernard Shaw; on no occasion were changes found in the pattern of the skin-pain plexuses.

Another possibility is that the pain may arise from excessive spasm or dilatation of a blood-vessel, the impulses merely being transmitted by the trigeminal pathways.

PERSONAL OBSERVATIONS

Of 250 personal cases 176 were treated by operation: the trigeminal pathways were approached extradurally

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TABLE I—DISTRIBUTION BY AGE AND SEX OF 250 CASES OF TRIGEMINAL NEURALGIA

Age (years)	No. of cases	
	Male	Female
20–29	1	1
30–39	6	12
40–49	15	17
50–59	24	29
60–69	36	60
70–79	11	34
80–89	—	3
90–	—	1
—	93	157

via the middle fossa. Although the middle meningeal artery varied in size, neither the artery itself nor its larger branches were ever found to be in such a position that they might beat against the third or second divisions of the nerve or against the ganglion. On one occasion only was a large artery discovered passing through the foramen ovale with the third division of the nerve. Usually large veins run along the margins of the divisions as they enter the ganglion; and, though these are often found congested at operation, it is doubtful whether they ever produce pain. On no occasion was there evidence of an angioma, either about the ganglion itself or along the territories of the second and third divisions. Sometimes the dura mater was thick, sometimes thin; sometimes it stripped easily from the bone, and sometimes it was densely adherent to the periphery of the middle fossa. Sometimes it would strip easily from the second and third divisions and from the ganglion itself; sometimes it was so adherent it had to be reflected by means of sharp dissection. In my opinion, it is not in the dural variations that the source of trigeminal neuralgia will be found. Obvious narrowing of the foramen ovale or foramen rotundum and constriction of the relative divisions was never found.

Thus no constant change was discovered that might account for trigeminal neuralgia in this series.

Histological Findings

Lengths of the third and second divisions, pieces of the ganglion, and lengths of the posterior root were removed and sectioned, care being taken to avoid artefacts. Of 15 specimens none was found to show any lesion. These examinations were also carried out by Professor Shaw.

Pieces of skin forming the trigger-points of the pain at the corner of the nose were excised as an ellipse in 3 patients. The pain plexuses in the skin were examined by the method of Weddell (1941); in none of these 3 instances was there any obvious alteration in the pain-plexus pattern, but Professor Shaw and I considered that there was an increase in fibrous tissue. As large nerve-roots pass, for example, along or through muscle-planes, they are surrounded by the equivalent of a synovial tunnel, which ensures that the nerve can slide freely without traction or distortion whenever the limb is made to move. Perineural adhesions resulting from inflammation will prevent the free slide of a large nerve along a neighbouring tissue and give rise to perineuritis and to pain. My suggestion is that a similar condition occurs about the peripheral filaments of the nerves, producing what could be termed perifilamentous adhesive neuritis. This differs from Harris's original hypothesis only in that he regarded the peripheral lesion as a mild interstitial neuritis. In my opinion, most of the evidence favours the conclusion that the lesion is essentially peripheral.

These histological experiments should be repeated, because trigeminal neuralgia can perhaps best be explained on Weddell's hypothesis.

TABLE II—SITE OF PAIN IN 250 CASES OF TRIGEMINAL NEURALGIA, ACCORDING TO AFFECTED DIVISION OF FIFTH CRANIAL NERVE

Division affected	No. of cases	Division affected	No. of cases
Unilateral:		*Bilateral:*	
1st	5	3rd rt and 2nd and 3rd lt	1
2nd	54	2nd lt and 3rd rt	1
3rd	38	2nd lt and rt	1
1st and 2nd	34	3rd lt and 2nd and 3rd rt	1
2nd and 3rd	80	2nd lt and 2nd and 3rd rt	1
All	34		
—	245	—	5

Material

The age and sex distribution of 250 consecutive personal cases of trigeminal neuralgia is shown in table I. In 82 cases the left side was involved and in 163 cases the right side, while in 5 involvement was bilateral. The sites of the pain are shown in table II.

The disorder had been present for up to 3 months in 13 cases, for 4–6 months in 15 cases, for 7–12 months in 32 cases, for 13 months to 5 years in 95 cases, for 6–10 years in 39 cases, for 11–20 years in 25 cases, for 21–30 years in 4 cases, and for 31–40 years in 1 case; in 26 cases the duration was not recorded. The shortest history was 1 week, and the longest over 40 years.

Blood-pressure

In 64 cases there was no record of the blood-pressure. Of the remaining 186 cases, there was hypertension in 96 (51·6%) (see table III). Patients were classified as hypertensive if the diastolic blood-pressure was 100 mm. Hg or more (see table III). It is very doubtful whether hypertension per se is a significant factor in the production of trigeminal neuralgia; many people above the age of 60 have hypertension without suffering also from trigeminal neuralgia.

TABLE III—DISTRIBUTION BY AGE AND SEX OF 96 CASES OF HYPERTENSION IN PATIENTS WITH TRIGEMINAL NEURALGIA

Age (years)	No. of cases	
	Male	Female
20–29	1	1
30–39	—	—
40–49	5	4
50–59	6	14
60–69	17	25
70–79	4	18
80–89	—	1
90–	—	—
—	33	63

Surgical Relief

Since trigeminal neuralgia is not caused by any lesion that is otherwise injurious to the patient, the only object of operation is to relieve pain. Moreover, the pain does not become intractable or incurable if surgical treatment is withheld or delayed. After root section regeneration of the trigeminal pathways is impossible, and after destruction of the ganglion by alcohol it is unlikely; so relief obtained by root section or alcohol ganglion block is likely to be permanent. On the other hand, resection or alcohol block of the trigeminal pathways distal to the ganglion may give only temporary relief.

Division of the trigeminal pathways causes numbness in the territory of the face concerned, and numbness is a positive sensation carrying with it a disagreeable feeling of cold, stiffness, and swelling. Should the pain be unrelieved by destruction of a trigeminal pathway, the patient's burden is increased by this added disagreeable sensation. Therefore unless there is a definite probability that trigeminal section will result in relief, this manœuvre should not be undertaken.

I believe that it is wrong, in the interests of permanent cure, to render the whole of the face numb when only

TABLE IV—TREATMENT OF 250 CASES OF TRIGEMINAL NEURALGIA

Initial treatment	No. of cases	Subsequent treatment
Injection :		
Gasserian ganglion	47	—
2nd division	1	Ganglion injection in 6 cases
3rd division	6	
3rd division and infra-orbital nerve	1	
Infra-orbital nerve	17	
Supra-orbital nerve	1	
Infra-orbital and supra-orbital nerves	1	
Total	74	
Operation :		
Complete root section	15	—
Fractional root section	113	Complete root section in 3 cases
Intracranial 2nd-division neurectomy	38	Complete root section in 1 case
Avulsion of supra-orbital nerve	1	—
Avulsion of infra-orbital nerve	9	—
Total	176	

one area is painful; in my experience, it is not true that a patient's morale is undermined by fear of a possible return of the pain with consequent need for further operation. On the contrary, I have found that most patients prefer to have as little done as will give immediate relief from pain for a reasonable length of time, and that if further operation does become necessary they show no undue apprehension.

In this series, of the 250 patients, 34 had pain in all divisions and 172 had no pain in division 1 (see table II). Among these 172 the disorder had been present for several years, and therefore spread of pain to division 1 is by no means inevitable even after a long period. As table IV shows, complete root section or ganglion block is not necessarily inevitable following incomplete operations, such as fractional root section, peripheral neurectomy, or peripheral nerve block.

Controlled fractional block of the ganglion is not technically possible by injection; so if the ganglion is injected in all cases, whether or not the first division is affected, the danger of paralytic interstitial keratitis must be greater than with fractional root section, by which the ophthalmic fibres can be spared in suitable cases.

Where the first division is affected, the advantage of ganglion injection over complete root section is that it avoids the danger of facial paralysis. Regarding danger to life, I have been operating on the trigeminal pathways by the extradural middle fossa approach for more than twenty years without a single death. Operation is very much easier for the patient, because it eliminates the usually very distressing experience of having a needle plunged into the face. In this series there is no doubt that the patients treated by operation were much more grateful than those treated by injection.

The advantages of fractional root section in suitable cases are outstanding: the cornea can be left sensitive, the numb area confined to the affected divisions, and the motor nerve spared. In this series there was no instance of permanent facial paralysis after complete or fractional root section. In my opinion, fractional root section is the method of choice in all cases where the first division is not affected. Where the first division is affected, alcohol injection and root section are equally efficient. Root section is a precise procedure, and I have never yet failed to section the root when this has been necessary; even the most expert, however, can fail to introduce a needle into the ganglion.

There is now a tendency in some centres to approach the posterior root via the middle fossa intradurally. The advantage of this method is the avoidance of facial paralysis and of bleeding into the middle ear. The intradural approach, though now safe in most hands, must, by its very nature, carry a greater risk to life than the extradural approach. The actual section of the root fibres is equally precise by either method.

Intracranial extradural neurectomy of the second division is a most valuable procedure in suitable cases. By this means, the territory of only the maxillary division of the face need be denervated when the pain is confined to this area. Occasionally, when doing a fractional root section I also do neurectomy of the second division when it is essential that no fibres of this division be spared but no fibres of the first division sacrificed. With neurectomy of the second division alone, there is no danger of paralytic interstitial keratitis or of facial paralysis.

Extracranial alcohol blocks of the second and third divisions are safe and produce local denervation only. Their chief disadvantage is that the relief is temporary, lasting at most two or three years.

Avulsion of the supra-orbital or infra-orbital nerve is not a serious undertaking and is worth trying in old people when the trigger-point seems to be in one of these areas. The relief gained, however, is merely temporary.

Although procaine injection into the gasserian ganglion has not been applied in this series, it will often bring to an end a bout of trigeminal neuralgia and provide a period of remission.

Lastly, I would emphasise again that where the ophthalmic division is unaffected, fractional root section by the middle fossa extradural approach is, in my opinion, the treatment of choice.

Summary

A series of 250 cases of trigeminal neuralgia is analysed.

On the basis of histological studies it is suggested that the lesion is essentially peripheral, consisting in "perifilamentous adhesive neuritis."

Relief of the pain by surgical treatment is discussed.

I should like to take this opportunity of thanking Prof. F. J. Nattrass, Dr. W. Ritchie Russell, and Dr. R. Whitehead for their helpful criticisms in the preparation of this paper.

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ANÆSTHETIC EXPLOSIONS
PREVENTION BY WITHDRAWAL METHOD

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THE causes of anæsthetic explosions and the current methods for their prevention in Great Britain have been described by Lowe (1950) and Hadfield (1952). In the U.S.A. more elaborate precautions are taken owing to the greater danger of static sparks and the use of ethylene. Electrostatic hazards have been discussed by Bulgin et al. (1949), Magee and Bracken (1952), and Roberts and Hewer (1953).

Whenever explosive gases or vapours are in use, there is always a risk of explosion, be it remote, since the possibility of their being ignited by a static spark cannot be entirely ruled out. There are occasions when the use of an explosive agent (diethyl ether in particular) is highly desirable in the presence of a known source of ignition—e.g., diathermy—and many anæsthetists finding themselves in this position have their own methods of minimising the risk of explosion.

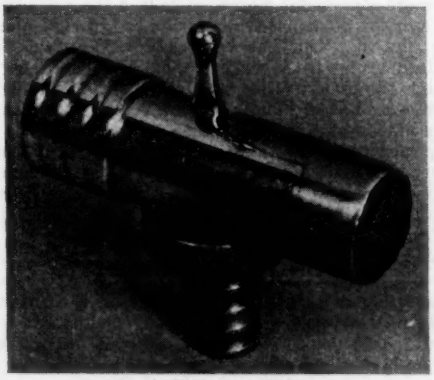

Fig. 1—T-junction with tap.

A serious type of anæsthetic explosion, often fatal to the patient, is that which happens when a collection of gases in the room is ignited at some distance away from the anæsthetic apparatus; a flame travels across the room and "lights back" through the leak-point in the apparatus; the gases inside the apparatus and the patient's air-passages then explode. The method about to be described prevents this type of explosion.

Withdrawal Method

In the ordinary way explosive gas mixtures are allowed to escape through expiratory valves or other leak-points from the anæsthetic apparatus into the atmosphere of the room in which the anæsthetic is being administered.

By the withdrawal method the gases are not allowed to enter the atmosphere of the room; they are withdrawn out of the room through a pipe from the apparatus. This is achieved quite simply by the use of a T-junction, which is plugged into the anæsthetic circuit, the gases being led away from the junction through a length of rubber tubing ("withdrawal tubing") connected to it. The withdrawal tubing leads away through a door or a window or through the floor (see below) to a safe place.

T-junction (fig. 1).—The horizontal limb has a male connection at one end and a female connection at the other end; it plugs into, and makes continuity with, any part of an anæsthetic circuit with standard connections. The vertical limb is a tube of $^1/_2$ in. internal diameter and can be shut off from the horizontal limb by a tap. $^1/_2$ in. rubber tubing is connected to the vertical limb and may be of any length, since only the very slightest resistance (equal to a pressure of less than 0·5 cm. of water) is offered to the escape of gases along this tubing.

Fig. 2—T-junction in use with semi-closed ("semi-T-piece") anæsthesia. Valve unit could be removed altogether, if desired.

Clinical Use

"SEMI-CLOSED" CIRCUIT

Fig. 2 shows the method in use with a continuous-flow semi-closed circuit. The T-junction may be interposed between the valve-mount and the endotracheal adapter, or angle-mount to face-piece. When the tap of the T-junction is open, gases will pass along the withdrawal tubing rather than through the expiratory valve, there being more resistance in the latter; the reservoir bag collapses until almost empty.

If positive pressure is required for artificial respiration, the expiratory valve is first screwed down and the tap adjusted, in much the same way as an expiratory valve, to increase the pressure in the circuit.

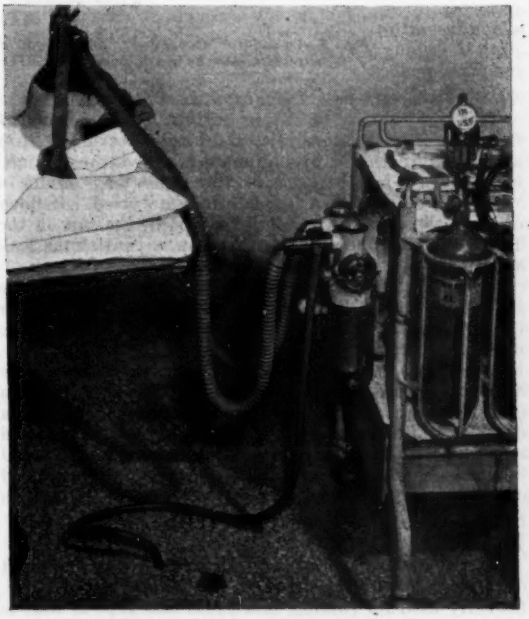

Fig. 3—Withdrawal method in use with circle absorber, explosive gases being led away through floor.

If the patient is breathing spontaneously, an anæsthetic administered in this way is a cross between a semi-closed circuit and my T-piece technique (Bullough 1952). I call this "semi-T-piece anæsthesia."

The flow-rates of gases, &c., are exactly as for semi-closed anæsthesia or my T-piece technique.

CARBON-DIOXIDE ABSORPTION CIRCUITS

"*Closed Circle*"

When a "closed" circuit is in use with "basal" oxygen, plus ether or cyclopropane, and the apparatus is gastight, it will usually be found that the reservoir bag becomes distended periodically and some gases must be allowed to escape. This is because, almost invariably, for various reasons, more gases are run into the circuit than the patient can absorb. Conversely, if the bag does not become distended, it is highly probable that there is a considerable leak in the circuit.

Clearly the "closed" circuit cannot be relied on entirely to eliminate ignition of gases outside the apparatus.

First, all expiratory valves, &c., are securely shut off; the T-junction is plugged into the expiratory port

of the absorption unit (fig. 3) and the hosing connected to the T-junction; the tap is turned off. Whenever the reservoir bag becomes distended the tap is opened, the bag is squeezed until half-empty, and the tap is closed again. The excess gases pass away along the withdrawal tubing out of the room.

Fig. 4—To-and-fro absorption: withdrawal of explosive gases by use of tap on bag.

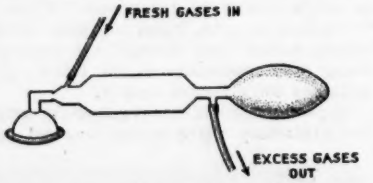

Fig. 5—To-and-fro absorption: withdrawal of explosive gases by use of T-junction.

Circle Absorption with Intentional Leak

This is a common technique, nitrous oxide and oxygen being the basic mixture, with total gas-flows of 1–5 litres a minute. If ether or cyclopropane is added, the administration may be managed in the same way as for a "closed" circuit when low gas-flows are used. If flows of more than 3 litres a minute are used, the tap on the T-junction may be adjusted to allow a continuous leak at any desired pressure.

If the patient is breathing spontaneously and the junction is placed between the patient and the absorber (fig. 3), some "rebreathing" can take place along the expiratory hosing. Owing to the design of the junction, however, this is very slight, provided the gravity valves are working freely. In addition, a high flow of fresh gases prevents any appreciable accumulation of carbon dioxide. "Rebreathing" will not take place if artificial respiration is in progress, or if the junction is placed between the absorber and the bag, as is easily arranged on other types of apparatus, or when a bag is used in place of the concertina on the type illustrated.

To-and-fro Absorption

Figs. 4 and 5 show how this method may be used during to-and-fro absorption. A small tap (fig. 4), formerly used for running gases into this type of bag, is now used to lead gases away. Alternatively, a T-junction (fig. 5), with unions of a suitable size, is interposed between the bag and the canister.

Disposal of Gases

The gases may be led away through any length of withdrawal tubing through a door or a window, to a safe place, preferably out of human reach, where they will not be ignited by cigarettes, &c.

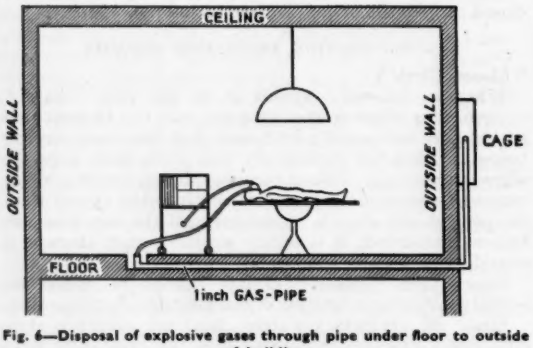

Fig. 6—Disposal of explosive gases through pipe under floor to outside of building.

A more convenient method is to lead the gases through a hole in the floor placed near the head of the operating-table (fig. 3). This has been done at hospitals in the Dartford group by installing a metal pipe which leads through the floor to the outer wall of the building, and up this wall out of human reach (fig. 6). (Back-pressure in the pipe is negligible, less than 1 cm. of water.)

A perforated box or cage surrounds the end of the pipe as an additional safeguard against cigarette ends, and a warning notice is placed on the cage. It is hoped to find a gauze, like Davy gauze, which will prevent ignition and "lighting back" of emerging gases.

Discussion

The safety of this method depends on the anæsthetic apparatus, and the junction between apparatus and patient, being leakproof at the pressure at which the anæsthetic is being administered.

A great deal of the anæsthetic apparatus at present available in this country was designed before the risk of explosion had become what it is today. Electrical apparatus is now in almost constant use; techniques involving artificial respiration, and therefore high pressure in the apparatus, are also the rule rather than the exception in many operating-theatres.

In the apparatus illustrated in fig. 3 there are a dozen places where leakage can take place, excluding the rubber parts. Such an apparatus is difficult to keep gastight, and one is inevitably led to the conclusion that new apparatus should be designed to remain gastight under present methods of usage.

A gastight junction to the patient can fortunately be achieved with a cuffed endotracheal tube. If rupture of this cuff would be highly dangerous, a second cuff could be applied to the tube. Face-masks with inflatable rims are available which will form a gastight junction to moderate pressure in a high percentage of patients.

During artificial ventilation of the lungs, pressures in the circuit of 20 cm. of water are common and pressures of 40 cm. of water or more are not uncommon; in some circumstances far higher pressures are used for short periods. Clearly leakage from the circuit is far more likely to take place during artificial respiration than when the patient breathes spontaneously.

When the patient is breathing spontaneously, the pressure inside any circuit need not rise above 4 cm. of water. When the semi-T-piece method is used, the pressure will be less than 1 cm. of water, at which pressure leakage is quite easily prevented in present-day apparatus. I consider that this technique can be safely used with explosive anæsthetics in the same room as a known source of ignition, and have so used it for the last three years.

If this method is adopted as an additional safeguard against anæsthetic explosions, I suggest that, when pipes are laid to carry anæsthetic gases into an operating-theatre, an additional pipe be laid to carry them out again.

Quite apart from preventing ignition of anæsthetic gases, this method relieves all operating-theatre personnel from the necessity of breathing noxious anæsthetic gases and vapours emanating from the anæsthetic machine.

Summary

A simple method of preventing ignition of anæsthetic gas mixtures in operating-theatres, &c., is described: the withdrawal method.

The gases are prevented from entering the atmosphere of the theatre.

A T-junction, with a tap, is plugged into an anæsthetic circuit; a pipe attached to this conveys gases from the theatre to a safe place outside.

There is a need for anæsthetic apparatus of a new design, easily kept gastight to the pressure used in

clinical anæsthesia today. Only when the patient is breathing spontaneously can leakage from apparatus at present available be easily prevented

Operating-theatre personnel are relieved from breathing anæsthetic gases by the withdrawal method.

I wish to thank Dr. M. Mitman, Dr. R. G. Henderson, C.B.E., and Dr. T. S. Cochrane, superintendents of the hospitals in the Dartford Group, for their interest in this method and for its installation in the operating-theatres in the Group; the hospital engineers for installing the apparatus to my specification; the British Oxygen Company for assistance in developing the method and for making the T-junctions; and Messrs. Woods & Porter, West Hill, Dartford, for the photographs. The T-junction may be obtained from Messrs. Charles King Ltd.

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CLINICAL TESTS FOR KETONURIA

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ALTHOUGH the clinical tests for urinary ketones are essentially qualitative, it is customary for clinicians to give them a quantitative significance based on certain characteristics, such as the intensity of the colour reaction and the rapidity of development of a colour, or by comparing the results of tests of different sensitivities. The usual tests vary so much in technique and interpretation that it is difficult to compare the results of different workers, especially when + symbols are used.

Friedemann et al. (1946) have reviewed the many ways in which the nitroprusside reaction may be used for detecting ketone bodies, and have drawn attention to the variety of methods and sensitivities reported.

Some workers state that the colour given by the nitroprusside reaction is due mainly to the presence of acetone (King 1951, Stanley 1943), whereas others state that it is due to both acetone and aceto-acetic acid (Harrison 1947). All workers agree that β-hydroxybutyric acid gives no reaction with sodium nitroprusside.

Few textbooks adequately present either Rothera's (1908) or Gerhardt's (1865) test.

Describing the Rothera test Todd et al. (1953), Lawrence (1950), and Harrison (1947) do not indicate that the urine must be saturated with ammonium sulphate to give the maximal sensitivity.

Bayliss (1950) adds 2 or 3 drops of a "concentrated" sodium nitroprusside solution, whereas King (1951) adds 8–10 drops of a 0·25% solution in 1% nitric acid.

The time allowed for the colour reaction to develop before its intensity is read varies from 1 to 30 minutes (Fearon 1946, Haler 1951, Lawrence 1950), or is not mentioned at all (Carter and Thompson 1953, Hawk et al. 1947).

Descriptions of Gerhardt's ferric-chloride test are also at variance. The strength and quantity of ferric-chloride solution used is often omitted. No workers agree about the time of boiling the urine to distinguish the colour given by aceto-acetic acid from that given by non-ketone substances, only one of them emphasising that the boiling should be prolonged (Hutchison and Hunter 1951).

It is therefore not surprising that clinicians do not usually relate the results of the tests with actual concentrations of ketone bodies present in the urine. It follows that the clinical tests for urinary ketones are of limited value in following the progress of a patient in ketosis. We report here studies of the Rothera nitroprusside and Gerhardt ferric-chloride tests, and include observations on a recently developed "nitroprusside tablet." † The object is to assess the significance of these tests so as to provide a more precise interpretation than has been possible hitherto. The relative merits of the tests for routine use were also studied.

Methods

Since the urine of patients with ketosis was not always available when required for study, it was necessary to add ketone bodies to normal urine. Preliminary experiments indicated that urines to which known concentrations of acetone and aceto-acetic acid had been added gave reactions of the same colour and intensity as those given by similar concentrations found in the urine of ketotic diabetic patients. To determine the relative proportions of acetone and aceto-acetic acid in the urine of ketotic patients, estimations of the individual ketone bodies were made by the method of Thin and Robertson (1952) on specimens of urine giving positive results to Rothera tests.

Stock solutions were made from aceto-acetic acid prepared by the method of T. E. Friedemann (personal communication) and from 'Analar' acetone and the concentrations determined (Thin and Robertson 1952). These solutions were added to normal urine to give concentrations of aceto-acetic acid ranging from 0 to 2000 mg. per 100 ml. in steps of 50 mg. per 100 ml. Further dilutions were made when necessary. The three tests studied were applied to these specimens of urine according to the methods described below. After preliminary trials each test was finally repeated twenty times on different occasions. In the Gerhardt ferric-chloride test the colour due to aceto-acetic acid is distinguished from that given by excreted products of certain drugs by boiling the urine and repeating the test. To establish the minimal time of boiling required to remove all the aceto-acetic acid present, 20 ml. aliquots of urine containing 25, 100, and 300 mg. of aceto-acetic acid per 100 ml. were boiled vigorously in a 50-ml. beaker for 5, 10, 15, and 20 minutes respectively, and the test was repeated after cooling and adjusting the volume to 20 ml.

TECHNIQUE OF TESTS

Rothera's Test

Of the various techniques reported that recommended by Friedemann et al. (1946) was found to be the most satisfactory. About 5 ml. of fresh urine is saturated with ammonium sulphate, and 10 drops of 2% sodium nitroprusside solution is added. The solution is well mixed, and 10 drops of concentrated ammonia (sp. gr. 0·880) is added. The purple colour due to the presence of acetone or of aceto-acetic acid is allowed to develop for 15 minutes. The reasons for selecting this particular technique are as follows:

(1) The urine must be saturated with ammonium sulphate to give the maximal sensitivity and to reduce the interference of non-ketone substances.

(2) A minimal quantity of sodium nitroprusside is used so as not to confuse a trace reaction with a colour due to excess reagent.

(3) The colour due to aceto-acetic acid reaches a maximal intensity in about 10 minutes, and that due to acetone in 20–30 minutes. After this time the colour begins to fade. Also, several sulphydryl compounds give red colours which develop in a few seconds but fade within 3 or 4 minutes. By choosing a time of 15 minutes false positives are avoided and a maximal colour is obtained.

* In receipt of a scholarship grant from the Royal Free Hospital Endowment Fund.

† 'Acetest Reagent Tablet' manufactured by Miles Laboratories Ltd. (distributors Don S. Momand Ltd.).

Gerhardt's Test

Ferric-chloride solution 10% is added drop by drop to about 2 ml. of fresh urine. A precipitate due to phosphates usually forms but redissolves on further addition of ferric chloride. A reddish-brown colour may indicate the presence of aceto-acetic acid. If such a colour does develop, the urine must be boiled in an open vessel—e.g., a beaker—for at least 15 minutes to decompose the aceto-acetic acid to acetone, most of which boils off. If the boiled and cooled urine still gives a reaction similar to that of the unboiled urine, it is due to substances other than aceto-acetic acid.

TABLE I—CONCENTRATION OF KETONE BODIES IN URINE OF 21 KETOTIC DIABETIC PATIENTS

Acetone (mg. per 100 ml.)	Aceto-acetic acid (mg. per 100 ml.)	β-Hydroxy-butyric acid (mg. per 100 ml.)	Total ketones (mg. per 100 ml.)	Ratio of aceto-acetic acid to acetone
5·9	62·3	188·2	256·4	10·1
13·3	95·6	198·6	307·5	7·2
13·8	120·0	244·1	377·9	8·7
13·7	136·8	157·2	307·7	10·0
49·0	94·8	435·7	579·5	1·9
13·2	106·4	173·0	292·6	8·1
13·4	64·9	156·6	234·9	4·8
4·1	17·3	179·0	200·4	4·2
2·2	16·0	65·5	83·7	7·3
2·8	24·1	52·8	79·7	8·6
2·4	30·9	75·5	108·8	12·9
1·7	15·8	57·3	74·8	9·3
2·0	19·8	75·7	97·5	9·9
3·3	33·2	88·8	125·3	10·0
4·4	66·2	110·6	181·2	15·0
1·8	19·1	34·8	55·7	10·1
1·3	13·0	37·5	51·8	10·0
1·2	7·2	14·0	22·4	6·0
2·3	40·0	49·5	91·8	17·4
2·1	30·9	62·7	97·5	14·7
0·9	9·5	87·0	97·4	10·5

Mean ratio of aceto-acetic acid to acetone 9·4 ± 3·6.

Nitroprusside-tablet Method

This tablet contains sodium nitroprusside, glycine, disodium phosphate, and lactose. The technique adopted for this test is that described by the manufacturers. A tablet is placed on a clean white surface, and one drop of urine is allowed to fall gently on to it. At the end of 30 seconds the purple colour which develops when the test is positive is compared with the three shades of colour on the scale provided with the tablets. When the test is negative, the tablet remains unchanged in colour except for a slight creaminess due to the colour of the urine. In common with all nitroprusside reactions for ketone bodies the colour will continue to develop for several minutes. For this reason the colour scale is designed for use at the end of 30 seconds.

TABLE II—SENSITIVITIES OF ROTHERA TEST TO ACETONE AND ACETO-ACETIC ACID ADDED SEPARATELY TO NORMAL URINE

Result	Acetone (mg. per 100 ml.)	Aceto-acetic acid (mg. per 100 ml.)
Trace	25	1
+	100	5
+ +	200	10
+ + +	300	15
+ + + +	400	20

Results

The levels of the different ketone bodies occurring in the urine of a series of ketotic diabetic patients whose ketosis ranged in severity from mild to precomatose are presented in table I. The levels of β-hydroxybutyric acid are included, although this ketone cannot be detected by the clinical tests for ketonuria.

A deep purple, through which it was only just possible to see transmitted light, was given by a solution of 400 mg. of acetone per 100 ml. in urine with the Rothera test. This depth of colour was called + + + +. A faint purple was given by 25 mg. of acetone per 100 ml. This was called a "trace." +, + +, and + + + reactions were assigned to proportionate levels between these extremes.

TABLE III—SENSITIVITY OF GERHARDT TEST TO ACETO-ACETIC ACID ADDED TO NORMAL URINE

Result	Aceto-acetic acid (mg. per 100 ml.)
Trace	25
+	50
+ +	100
+ + +	150
+ + + +	200

Solutions of aceto-acetic acid were found which gave colour reactions corresponding to the intensities of colour given by the acetone solutions mentioned above. The concentrations at each level for both acetone and aceto-acetic acid are shown in table II.

In determining the sensitivity of Gerhardt's ferric-chloride test the use of a standard solution of aceto-acetic acid was found to be undesirable, because its preparation was lengthy and its stability poor. It was therefore necessary to prepare an arbitrary standard which could be easily made up and did not deteriorate quickly. A solution of ethyl acetone dicarboxylate in urine gave a colour with ferric chloride which closely matched that given by the addition of ferric chloride to urine containing aceto-acetic acid. A 1% solution of ethyl acetone dicarboxylate in normal urine gave, on the addition of ferric chloride, a colour which corresponded to a strongly positive Gerhardt test such as is found in severe ketosis. This colour was called + + + +, and on analysis was found to be equivalent to about 200 mg. of aceto-acetic acid per 100 ml. The lowest level at which a definite colour could be clearly detected without the aid of a control tube was about 25 mg. of aceto-acetic acid per 100 ml. As before, +, + +, and + + + were assigned to reactions lying proportionately between these extremes (table III).

TABLE IV—EFFECT OF BOILING URINE ON GERHARDT TEST

Duration of boiling (min.)	Aceto-acetic acid		
	25 mg. per 100 ml.	100 mg. per 100 ml.	300 mg. per 100 ml.
0	Trace	+ +	+ + + +
5	1/2-trace	Trace	+
10	Negative	Negative	Trace
15	Negative	Negative	Negative

Table IV shows the result of boiling the urine containing various concentrations of aceto-acetic acid for different lengths of time. If only a little aceto-acetic acid is present, 10 minutes' boiling should be sufficient to remove it; but, if larger quantities are present, 15 minutes' boiling is necessary to ensure that no aceto-acetic acid remains.

The determination of the sensitivity of the nitroprusside tablets is much simplified by the use of the colour scale provided with the tablets. The concentrations of acetone and of aceto-acetic acid which corresponded most closely to each shade on the colour scale are shown in table V.

TABLE V—APPROXIMATE SENSITIVITIES OF NITROPRUSSIDE TABLETS TO ACETONE AND ACETO-ACETIC ACID ADDED SEPARATELY TO NORMAL URINE

Result	Acetone (mg. per 100 ml.)	Aceto-acetic acid (mg. per 100 ml.)
Detects	25	5
Trace	100	20
Moderate	250	40
Strongly positive ..	800	80

Discussion

Table I shows that there is usually about nine times as much aceto-acetic acid as acetone present in the freshly voided urine of ketotic patients, which is in agreement with Folin (1934), who found a ratio of 10 to 1. With the Rothera test aceto-acetic acid yields a colour about twenty times as intense as that of an equal concentration of acetone (table II). Therefore only about a two-hundredth of the colour produced is due to acetone. Even in severe ketosis levels of acetone greater than about 50 mg. per 100 ml. have not been observed. It follows that for practical purposes the Rothera test can be regarded as a test for aceto-acetic acid only.

Table II shows that a deep purple (++++) is given by 20 mg. of aceto-acetic acid per 100 ml. In our experience clinical signs of ketosis do not develop when the urine contains less than about 50 mg. of aceto-acetic acid per 100 ml. Owing to the extreme sensitivity of the Rothera test concentrations of this level and greater all give ++++ reactions; hence differing degrees of clinical ketosis cannot be distinguished by the test. However, when the concentration of aceto-acetic acid in urine is very low, it is possible to detect differences in the colour intensity by a standardised technique. Table II shows that 1 mg. of aceto-acetic acid per 100 ml. can be detected, but it is not clear at present whether the detection of such small amounts of ketone bodies in the urine is of any help in assessing a patient's clinical condition. It appears that, unless a very carefully standardised technique is used for the Rothera test, misleading results will be obtained. Such a technique takes at least 15 minutes.

The Gerhardt test is more useful clinically than Rothera's test because it is considerably less sensitive and covers a wider range of ketone levels (table III). Unfortunately it has a serious disadvantage in that several drugs in common use produce excretory substances which give a colour with ferric chloride similar to that given by aceto-acetic acid. It is fairly easy to distinguish the colour due to drugs from that due to aceto-acetic acid by boiling the urine and repeating the test. Table IV shows that 15 minutes' boiling in a beaker is essential to ensure that all the aceto-acetic acid is removed. Momentary boiling in a narrow test-tube, as is usually done, is inadequate. Any routine test involving this amount of time is obviously impractical for ward use. Thus it seems that both the Rothera and the Gerhardt tests are far from ideal for ward and clinic use. Though laboratories using standardised techniques may achieve satisfactory results, it is unreasonable to expect nurses to devote the time necessary for the proper performance of these tests.

Little advance has been made in urinary ketone tests since the introduction of Rothera's test in 1908 until the recent production of a tablet form of the nitroprusside reaction. The tablet method appears to overcome many of the objections to the previous tests. The sensitivity of the tablets to aceto-acetic acid is roughly intermediate between that of the Rothera test and that of the Gerhardt test (tables II, III, and V). By the use of this test detection of the lower levels of ketonuria, which are of doubtful significance, is avoided. Clinical trials on a large series of ketotic patients will be necessary to establish a more exact relationship between the ketone content of the urine and the patients' condition. Clinical symptoms of ketosis are not evident when the ketone test shows less than a "trace" reaction by this method. As with the Rothera test, practically no colour is contributed by the acetone present, even in the urine of severely ketotic patients.

The advantages of the tablet method for general use are unquestionable. The tablet is stable and non-caustic, no obnoxious fumes or ammonia are evolved, and no other reagents or apparatus are required. It provides the clinician with a standardised procedure which is so simple that variations are unlikely. The nitroprusside reaction in this form is specific. The presence of blood-glucose, protein, creatinine, and the excreted products of commonly used drugs such as salicylates, phenazone, barbiturates, and phenol has no effect on the test. It is almost impossible to see a positive reaction with the older tests in a specimen which is grossly contaminated with blood. When the tablet is used, such a small amount of urine is required that the reaction is neither masked nor influenced by the presence of blood.

A major consideration in the routine testing of urine is the large amount of time taken. In this respect the tablets effect a very considerable saving. The Rothera test, as usually done, takes about 5 minutes, and the Gerhardt test about 2 minutes when negative and 6 minutes when positive (this allows only 2 minutes for boiling, which is inadequate for removing large amounts of aceto-acetic acid). Since the tablet method takes less than a minute, about 4 minutes is saved on each Rothera test. There would be a further saving of about 5 minutes on each Gerhardt test. If both of the older tests were superseded by a tablet test, about 10 minutes would be saved on each examination of urine. Gray and Millar (1953) have claimed that with 100 specimens of urine to be tested for sugar 9 hours is saved by using a tablet method. It appears that about 16 working hours would be saved on 100 urine tests done by the nitroprusside-tablet method. The tablet methods for sugar and ketones may be used simultaneously within a minute.

In view of the great clinical importance of tests for urinary ketone bodies the Rothera and Gerhardt tests seem to be unsatisfactory in comparison with other biochemical tests, such as those for glucose. The tablet adaptation of the nitroprusside reaction, in addition to being simple, quick, and reliable, provides an indication of the degree of ketosis, and seems worthy of more extensive clinical trials. For the detection of minute traces of ketone bodies Rothera's test is the most sensitive.

It is realised that the level of ketonuria is not always a reliable indication of the degree of ketonæmia. A rapid and accurate method of estimating the plasma-ketone level is required. Further studies on this problem are in progress.

Summary

The sensitivities of the Rothera, Gerhardt, and nitroprusside-tablet methods for detecting urinary ketones are compared, and their suitability for clinical use is discussed.

The earlier tests have several disadvantages, such as the absence of a standardised technique, and the large amount of time involved when the tests are correctly made.

The need for a simple and quick clinical method for detecting urinary ketone bodies is largely met by the introduction of the nitroprusside tablet.

The quantitative levels of the individual ketone bodies in the urine of patients in different degrees of ketosis are presented.

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POTENTIATION OF CORTISONE BY GLYCYRRHETINIC ACID

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WITH continuing restriction of supplies of cortisone in this country, any substance which might prolong or intensify its therapeutic action is worth investigating. Hitherto all efforts to produce such potentiation have failed; *p*-aminobenzoic acid, insulin, and other substances have not been proved useful in this respect. Some workers have found that gold therapy not only fails to increase cortisone action but actually reduces it—i.e., the two substances are antagonistic. When therefore Borst and his colleagues (1953) found that liquorice, in addition to a mineralocorticoid action, appeared to potentiate the action of cortisone in Addison's disease, we felt that a clinical trial in other conditions would be well worth while. Card et al. (1953) found in a case of Addison's disease that glycyrrhetinic acid, which occurs in liquorice in the form of its glycuronide (glycyrrhizinic acid), had effects on weight and electrolyte balance similar to those found after the administration of deoxycortone and cortisone. It seemed to us that this substance might be tried, in conjunction with small doses of cortisone, in cases of rheumatoid arthritis, to see whether this had any anti-inflammatory effect such as would be seen with larger doses of cortisone alone.

Methods

Eleven patients (six male, five female) were selected for study; their ages ranged from 39 to 65 years. Eight patients were treated in hospital, and these had a preliminary period of rest in bed. Most of the patients were also placed on a basic régime of physiotherapy. Each patient was then treated with cortisone. When the clinical condition was judged to be stationary inert lactose capsules were given in addition to cortisone for two days as a control; these capsules were identical with those containing glycyrrhetinic acid. A course of glycyrrhetinic acid 0·5 daily was then given, usually for five to seven days; during and after this course the dosage of cortisone was unaltered. The eleven patients received altogether fifteen such courses of glycyrrhetinic acid.

Two methods of stabilising the patient on cortisone were followed:

1. In the first method, used eleven times, the patient was given small doses of cortisone (15–37·5 mg. daily) until the clinical condition became static, with symptoms and signs only suppressed in slight degree; glycyrrhetinic acid was then added.

2. In the second method, used four times, larger doses of cortisone (37·5–100 mg. daily) were given until a remission was obtained; the dosage of cortisone was then progressively reduced until a slight relapse resulted; glycyrrhetinic acid was then given without further adjustment of the dose of cortisone.

Assessment

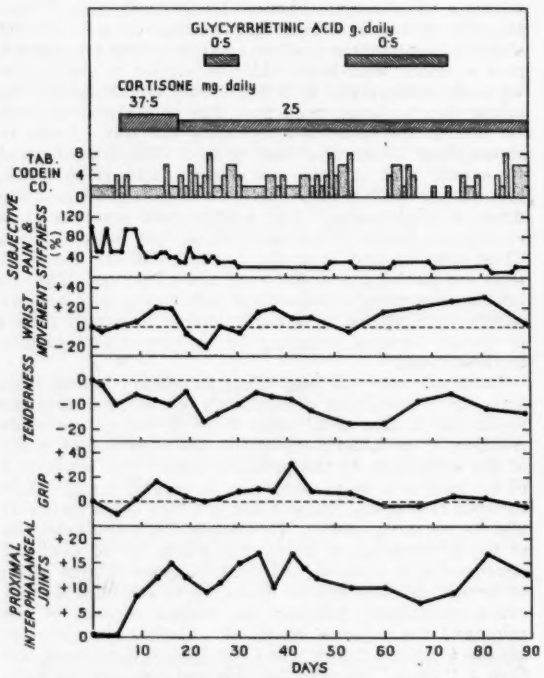
A combination of subjective and objective criteria was used for assessing the progress of the patient. Subjective assessment was based on: (1) the patient's own estimation of the degree of pain and stiffness expressed as a percentage of the pain and stiffness present at the onset of the trial; (2) the number of tablets of aspirin needed each day to relieve pain; (3) the grip of each hand, as measured with a dynamometer; (4) tenderness, as estimated by the application of gradually increasing pressure by the observer.

The range of movements of various joints—usually the wrists—was measured when applicable. In addition the degree of swelling of the proximal interphalangeal joints was measured by the use of Wheatsheaf rings; this has proved a reliable and sensitive method of measurement when used by the same observer (Hart and Clark 1951).

Results

On the whole, the results of the investigation were discouraging. In five patients the results were wholly negative; and in five others the results were probably negative, though certain unusual features were present. In only one patient was there any convincing evidence of potentiation of cortisone by glycyrrhetinic acid.

This patient, a woman aged 51, had had rheumatoid arthritis for two years. She was admitted to Westminster



Findings in case of rheumatoid arthritis treated with glycyrrhetinic acid.

The amount of pain and stiffness before starting the trial was estimated at 100%. Wrist movements, tenderness, grip, proximal interphalangeal joints swelling: "0" represents the state at the onset of the trial; "plus" figures represent improvement and "minus" figures deterioration. The measurements were appropriately standardised.

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Hospital on June 13, 1953, and after three successive subjective and objective assessments at intervals of three days had given fairly constant readings, she was treated with 37·5 mg. of cortisone daily. Within a few days she had a satisfactory remission, confirmed by all the subjective and objective criteria. After twelve days the daily dosage of cortisone was reduced to 25 mg., and within twenty-four hours there was a partial relapse, confirmed by further measurements taken four days later. A course of glycyrrhetinic acid was then given for seven days, with considerable improvement according to all methods of estimation (see figure). When the glycyrrhetinic acid was stopped there was a further relapse. She was discharged on 25 mg. of cortisone daily, and attended the outpatient department once weekly. A further course of glycyrrhetinic acid was then given, this time for three weeks. This immediately produced great symptomatic improvement, shown by the fact that the patient took no codeine tablets for seven consecutive days. Later there was objective improvement also. When the glycyrrhetinic acid was stopped the objective improvement continued for several days, and then a further relapse occurred. The patient has since been satisfactorily maintained on 37·5 mg. of cortisone daily.

In several other patients there was a suggestion that glycyrrhetinic acid might have a somewhat prolonged action; improvement occurred while a course of the drug was being given, but no relapse followed when the drug was stopped. It is more likely, however, that most of these inconstant improvements were due to the cumulative effect of rest in bed and small doses of cortisone. The absence of relapse when glycyrrhetinic acid was stopped is strong presumptive evidence that this drug was not responsible for the improvement.

Discussion

It is notoriously difficult to assess impartially the progress of patients with rheumatoid arthritis. Spontaneous remissions and relapses are frequent, and seriously handicap the most objective observer. The patients respond so readily to suggestion that improved performance-tests often merely reflect the enthusiasm of the investigator. Despite these pitfalls, we believe that from this small series of cases of rheumatoid arthritis it is justifiable to conclude that glycyrrhetinic acid has no distinct or constant potentiating action on cortisone. Possibly it may occasionally have a relatively mild effect—indeed, in the case described here it appeared to exert an effect equivalent to 12·5 mg. of cortisone. The inconstant improvement noted in several other patients supports this view, but such a feeble and inconstant action is unlikely to be of therapeutic value in treating rheumatoid arthritis.

Summary

Eleven patients with rheumatoid arthritis were treated with glycyrrhetinic acid 0·5 g. daily, usually in courses lasting from five to seven days. The patients had previously been stabilised with symptoms only partly relieved on small doses of cortisone, which were continued during the administration of glycyrrhetinic acid.

In only one patient was there any convincing improvement with relapse when the drug was stopped. In this case the drug had a potentiating action equivalent to 12·5 mg. of cortisone daily.

Any potentiating action by glycyrrhetinic acid is too slight and inconstant to be of value in the treatment of rheumatoid arthritis.

We wish to thank Mr. William Mitchell, PH.D., of Messrs. Stafford Allen & Sons Ltd., for supplies of glycyrrhetinic acid, and Prof. N. F. Maclagan, F.R.C.P., for his advice.

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LIQUORICE EXTRACT IN ADDISON'S DISEASE

SUCCESSFUL LONG-TERM THERAPY

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THE deoxycortone-mimetic action of the juice and extract of liquorice has been demonstrated in normal persons (Borst 1950) and in patients with Addison's disease (Groen et al. 1951, Card et al. 1953, Parrish and Alpert 1953). The triterpene constituent, glycyrrhetinic acid (Card et al. 1953, Pelser et al. 1953b), and its diglucuronate, glycyrrhizinic acid (Groen et al. 1951, 1952), have also proved effective in brief investigations in this disease. In the case described here liquorice extract was administered over a longer period.

Case-report

A housewife, aged 54, was admitted on April 19, 1952, with the classical features of Addison's disease. Weakness and loss of appetite and weight had been present for a year; brown pigmentation of the skin for nine months; and slowness of thinking for three months. Vomiting, faintness, and yawning had been frequent in the three weeks before admission. The history was negative regarding previous illnesses, operations, residence abroad, and family history of tuberculosis. The patient had a generalised "sun-tan," especially distinct over pressure areas, nipples, and axillæ; while black pigmented spots were present on the lips, tongue, and buccal cavity. The pulse-rate was 80 per min.; the blood-pressure was 85/55 mm. Hg, and there was no orthostatic hypotension.

Investigations

Table I summarises the biochemical and blood-pressure changes before and 1, 5, and 17 months after treatment with liquid extract of liquorice *B.P.* (Boots). When the daily dose was increased to 60 g. the blood-pressure, blood-urea, and serum-electrolyte values were restored to normal; and they have remained so, despite great reduction in the dose to prevent undesirable rises in blood-pressure. Serum-potassium and fasting blood-sugar values have fluctuated little, while results of blood-counts, hepatic tests, and urinalysis with microscopy have revealed no abnormality throughout.

The main pharmacological observations are summarised in table II, which shows the blood-pressure and general effect with, singly, liquorice extract (B), large doses of salt (C), and deoxycortone acetate (D), and a combination of liquorice extract and salt (E), compared with two separate-control phases (A) of one week without treatment. In each therapeutic phase (table II) the index of response adopted was the mean value of the four-hourly blood-pressure readings on the last day. This index was shown to be more reliable than body-weight in this patient. Each phase (B–E), with one exception, lasted one week or a multiple thereof. The exception was during combined liquorice and salt therapy (E_2), when, after two days on 60 g. of liquorice and 12 g. of salt daily, this treatment had to be terminated abruptly owing to premonitory pulmonary œdema with increased transverse diameter of the cardiac silhouette radiographically, associated with ankle œdema. Headache, which is a usual accompaniment of overdosage with liquorice (F. E. Revers, personal communication), was not present. This situation had occurred previously after two weeks of combined treatment with 30 g. of liquorice extract and 12 g. of salt daily (E_1). It can be concluded from table II that 60 g. of extract of liquorice by mouth daily and the 5 mg. of deoxycortone by intramuscular injection daily were about equipotent and more than adequate to control the disorder; whereas 12 g. of supplementary salt alone proved insufficient for stabilisation after a three-week trial.

Two other interesting actions of liquorice extract were evident. A cumulative effect was observed immediately after each of the two abrupt cessations of treatment due to incipient pulmonary œdema (F); the blood-pressure failed to drop to normal until a further seven days and 10 days respectively had elapsed. This cumulative effect was also observed later when the blood-pressure remained normal for up to two days after abrupt cessation of therapy. Secondly, increased sensitivity in the response to liquorice therapy was observed. For instance, a smaller dose (30 g.) five months after admission

TABLE I—BLOOD-PRESSURE AND BIOCHEMICAL FINDINGS BEFORE AND 1, 5, AND 17 MONTHS AFTER START OF LIQUORICE EXTRACT THERAPY

Phase	Blood-pressure (mm. Hg)	Serum-electrolytes (mg. per 100 ml.)			Blood-urea (mg. per 100 ml.)	Fasting blood-sugar (mg. per 100 ml.)	Neutral 17-keto-steroids (mg. per diem in urine)	Kepler test "A" value	CO_2-combining power (vols. %)
		Na	Cl (as NaCl)	K					
Before treatment	85/65	275	445	31	60	98	0·48	4·8	..
1 month later (60 g. ext. glycyrrh. liq. daily)	135/80	345	579	17	29	95	..	..	62
After further 4 months (30 g. ext. glycyrrh. liq. daily)..	130/80	325	555	18	34	100	0·62	4·5	63
After further year (4½ g. ext. glycyrrh. liq. daily) ..	125/80	315	573	19	35	96	0·76	9·2	60

(after completion of the pharmacological observations recorded in table II) maintained a normal blood-pressure, whereas in the first few weeks this dose was clearly inadequate. Reductions, to 3 g. daily at the time of writing (January, 1954), have continued; and latterly the maintenance of the desired blood-pressure has required very fine readjustments. Thus it was recently observed and verified that after a week on a daily dose of 2·5 g. the blood-pressure fell from normal to 110/70 mm. Hg, but the pressure rose to 150/90 after a daily dose of 3·5 g. daily for a further week. Such discrimination between doses differing by only 1 g. daily was not found in the initial phase of treatment with liquorice extract.

Discussion

Pelser et al. (1953a) provided the first evidence of the successful long-term treatment of Addison's disease solely with liquorice extract or its constituents. Their four patients were maintained in electrolyte equilibrium for periods ranging from one to two and a half years. The patient described here has now enjoyed good health for over a year as an outpatient and avers that this medicine is both palatable and free from undesirable effects on digestion or bowel habit.

The initial control in our patient required the large dose of 60 g. of liquorice extract daily. The absence of a favourable response earlier to half that dose tempted us to abandon this treatment. As treatment continued, however, the initial insensitivity to this therapy was soon reversed, and the patient's present maintenance dose is 3 g. daily. Pelser and associates (1953a) also observed increasing sensitivity to liquorice therapy. They considered that there was no evidence that this resulted from regeneration of adrenocortical remnants—a view confirmed by the present observations. In the present study a cumulative action of extract of liquorice was also observed.

TABLE II—COMPARATIVE EVALUATION OF VARIOUS TREATMENTS

	Treatment (in addition to ordinary diet)		Duration (weeks)	Mean blood-pressure (mm. Hg) on last day of study period	Effect
A	Nil		1	85/55	—
B	Ext. glycyrrh. liq.	5 g. t.d.s.	1	70/55	Nil
		10 g. t.d.s.	1	80/55	Nil
		15 g. t.d.s.	1	105/80	Slight
		20 g. t.d.s.	1	135/80	Definite
C	Sodium chloride	12 g. daily	1	80/60	Nil
		,,	2	85/55	Nil
		,,	3	110/75	Slight
D	Deoxycortone acetate	5 mg. daily	1	140/80	Definite
	(intramusc.)	2·5 mg. daily	1	110/70	Slight
A	None		1	80/60	Nil
E_1	Ext. glycyrrh. liq.	10 g. t.d.s.	1	145/90	Definite
	Plus sodium chloride	12 g. daily	2	175/100	Very definite
F	None (following E_1) ..		1	125/80	Cumulative
E_2	Ext. glycyrrh. liq.	20 g. t.d.s.	½	160/90	Very definite
	Plus sodium chloride	12 g. t.d.s.	..	..	..
F	None (following E_2) ..		1½	120/80	Cumulative

The action of liquorice extract is thought to be purely deoxycortone-mimetic (Borst et al. 1953, Pelser et al. 1953b). In our patient during continuous therapy with liquorice extract there were no significant changes in the results of the Kepler test or fasting blood-sugar levels to suggest any cortisone-like action by the extract. Determinations of urinary 11-oxysteroid excretion by the method of Talbot et al. (1945), slightly modified, showed that, compared with the normal range (0·15–0·40 mg. per 24 hr.) the value was below normal (0·025 mg. per 24 hr.) when no treatment was being given and above normal (0·5 mg. per 24 hr.) during treatment with 15 g. of liquid extract of liquorice daily. This suggests that the excretory products of liquorice extract may interfere greatly with the results obtained by this test. In another case of Addison's disease we sought by a modification of the method of Norymberski et al. (1953) to establish whether a similar interference disturbs the assay of urinary 17-ketogenic steroids. Apparently there is no such disturbance; for a normal value was obtained while the patient was receiving 60 g. of the liquorice preparation and 6¼ mg. of cortisone daily. It was further shown (J. M. Stowers, personal communication) that the liquorice preparation was itself a powerful reducing agent of the copper in the Talbot test for urinary corticoid assays (Talbot et al. 1945). Repeated determinations of the urinary neutral 17-ketosteroid excretion gave uniformly low results, as Hudson et al. (1953) have also found.

Liquorice therapy therefore does not appear to influence androgen metabolism. Although the skin pigmentation of our patient did not change significantly after the institution of liquorice therapy, the finger-nails appeared to become appreciably paler, suggesting that liquorice therapy may reduce melanin deposition in growing structures. This view was supported by microscopic study of the cut free ends of the nails, at various stages; but this observation has not been checked biochemically.

Patients with Addison's disease vary considerably in their sensitivity to liquorice or its constituents. Thus, Borst et al. (1953) reported that the deoxycortone-like effect of liquorice was absent in their three patients with Addison's disease, but that 10 mg. of cortisone restored fully the effect of the liquorice on mineral metabolism. I recently made a similar observation (to be published) in a patient who, on two attempts, could not be controlled adequately on liquorice therapy alone, although he responded to deoxycortone alone, and later to the combined administration of 6¼ mg. of cortisone and 60 g. of liquid extract of liquorice daily.

As with deoxycortone, for the maintenance of the more severe cases of Addison's disease liquorice must be administered along with cortisone. A synergistic action between these two drugs has been demonstrated by Borst et al. (1953), who described a patient who remained well for at least a year while receiving 16 g. of liquorice extract and 10 mg. of cortisone daily.

Thus it seems that Addison's disease may be treated over long periods with liquorice extract or its constituents, aided when necessary with concurrent cortisone therapy. Pelser (1954) has described a patient in whom the effect of glycyrrhetinic acid on electrolyte metabolism, although satisfactory, was potentiated by small doses of cortisone. The merits of liquorice therapy are its apparent effectiveness and safety, and the absence of undesirable side-effects, as well as its palatability, convenience, and cheapness.

Summary

A case of Addison's disease, well maintained for over a year on liquorice extract alone, is described.

The optimal daily dose of liquorice extract decreased from 60 g. to 3 g. in just over eighteen months.

In addition to this increased sensitivity to liquorice extract judged by the pressor response, a cumulative action was also evident.

Liquorice extract has a useful place in the long-term treatment of Addison's disease.

I am greatly indebted to Dr. John Gray for permission to undertake these investigations, to Dr. W. Walther and Dr. C. Raeburn for their coöperation in the biochemical and histological studies, to Dr. J. M. Stowers and Dr. J. D. N. Nabarro for the determinations of urinary 11-oxysteroids and of 17-ketogenic steroids, and to Mr. F. Allen for pharmaceutical advice.

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"... the study of pathology, conceived of in its widest sense, is of little value to one who is going to practise medicine unless it enables him to grasp clearly the functional changes that are produced by the anatomical changes so frequently caused by disease and seen post-mortem. For every sick person is essentially a functionally deranged organism. He may owe his symptoms to changes that are physically recognisable in his organs or to disorder in the workings of his mind or, if you prefer, of his central nervous system. A sick person is a person with morbid physiology or psychology, and the physician's business is to learn what the disorder—in its literal sense—is due to, and to apply this knowledge to remedy the defect—in other words, to 'cure' the patient. The modern trend is to use pathological knowledge to prevent disease, if that is possible, rather than to cure it. I cannot stress to you too much, therefore, the desirability of acquiring the point of view which will lead you to ask yourself in every case, 'What do the observations, of whatever nature, that I make tell me about the *disease process* from which my patient is suffering?' Never be intellectually satisfied with a diagnosis or a label. But it must be recognised with sadness that such an exhortation will probably affect the conduct of only the most alert students and practitioners."—Sir HOWARD FLOREY, F.R.S., in *Lectures on General Pathology*. London, 1954, p. 20.

INTRAVASCULAR HÆMOLYSIS IN CHOLERA

THE EFFECT OF OXYTETRACYCLINE

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THE observation of hæmoglobinuria in a case of cholera (De et al. 1952b) led us to wonder whether intravascular hæmolysis is a regular feature of this disease; and, if so, what may be its possible mechanism and effects. In an attempt to elucidate these points we have made a special study of some cases admitted to the cholera ward.

Materials and Methods

The patients came in with a history of vomiting and purging and with signs of shock. They may be divided into three groups:

Group 1.—23 patients were given the routine treatment of intravenous hypertonic alkaline saline solution followed by physiological saline solution. None had oxytetracycline (terramycin). In each case *Vibrio choleræ* (21 Ogawa and 2 Inaba strains) was isolated from the stools.

Group 2.—7 patients received oral oxytetracycline 1000 mg. on admission with 500 mg. after two hours and then four-hourly to a total dose of 5·0 g. They were given intravenous saline solution as in group 1. Their stools contained *V. choleræ* (Ogawa).

Group 3.—7 patients in whom *V. choleræ* could not be isolated from the stools received routine intravenous saline solution as in groups 1 and 2 and served as controls. No oxytetracycline was given.

Soon after admission 5–10 ml. of venous blood was collected: of this 2 ml. was heparinised and the rest allowed to clot. The serum-bilirubin level was estimated (one-minute and thirty-minute) by the modified Malloy and Elvyn technique (Ducci and Watson 1945) and the van den Bergh reaction was determined. Hæmoglobin percentage (Sahli), erythrocyte-count, and packed-cell volume were estimated from the heparinised fraction. The supernatant plasma from the centrifuged heparinised sample was examined for the colour of hæmoglobin, which if present was measured with a photo-electric colorimeter by the acid-hæmatin method. The deposited red cells were washed thrice in physiological saline, and the osmotic fragility was determined by the technique described by Dacie and Vaughan (1938). In the cholera cases the effect of mechanical trauma on the red cells (ninety shakes per minute for half an hour in a Kahn shaker) was also noted. Samples of heparinised and clotted blood were collected similarly on the second, fourth, and eighth days, and all the above-mentioned investigations except the fragility tests were repeated.

The first sample of urine passed after the period of anuria was collected and centrifuged, and the supernatant fraction was examined chemically and spectroscopically for methæmoglobin.

Findings

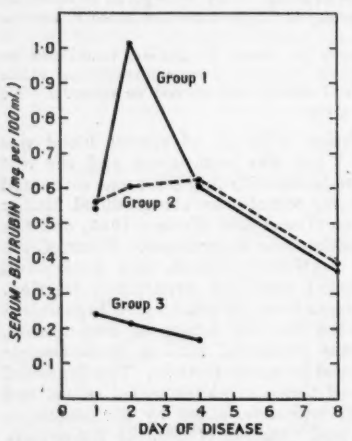
The accompanying table shows the average figures worked out from the above investigations. It will be seen that in all the groups there was considerable hæmoconcentration on the first day: the hæmoglobin percentage was much raised (112–116% Sahli) and the

BLOOD CHANGES IN CHOLERA AND NON-CHOLERIC DIARRHŒA

Group	Day of disease	Hb % (Sahli)	Red cells (million per c.mm.)	Packed-cell volume (%)	Serum-bilirubin (mg. per 100 ml.)	Osmotic fragility (% NaCl)		
						Starts	Completed	M.C.F.
1	1	115	5·71	51·35	0·54	0·457	0·297	0·370
	2	95·4	4·94	42·7	1·09	..	..	..
	4	90·6	4·64	40·5	0·62	..	..	..
	8	85·2	4·38	40·2	0·38	..	..	..
2	1	112	5·67	49·4	0·55	0·435	0·295	0·370
	2	103	5·08	42·7	0·61	..	..	..
	4	91	4·44	38·3	0·63	..	..	..
	8	61·5	3·72	32·5	0·39	..	..	..
3	1	116	6·27	54·4	0·24	0·450	0·303	0·390
	2	100·7	5·26	42·6	0·22	..	..	..
	4	100·5	5·27	43·5	0·16	..	..	..
	8	..	..	..	..	..	..	..

Mean figures have been tabulated.

erythrocyte-count (5,670,000–6,270,000 per c.mm.) and packed-cell volume (49·4–54·4%) increased. These figures gradually came down during convalescence. The one-minute or prompt serum-bilirubin level was 0 in all the cases; but the thirty-minute serum-bilirubin varied among the different groups. The average serum-bilirubin was higher (0·54–0·55 mg. per 100 ml.) on the first day in the cholera cases (groups 1 and 2) than in the controls (0·24 mg. in group 3). Besides, the patients in group 1, who received no oxytetracycline, showed on the second day a steep rise in the serum-bilirubin level (1·09 mg. per 100 ml.), which gradually fell later (see figure). In group 2, who received oxytetracycline, this acute rise of serum-bilirubin on the second day was absent, although hyperbilirubinæmia persisted even to the fourth day (0·62–0·63 mg. per 100 ml.). In the controls in group 3 the bilirubin curve remained almost flat at a low level (0·16–0·24 mg. per 100 ml.). The serum van den Bergh reaction was immediate direct negative and indirect positive.



Serum-bilirubin levels in 23 cholera patients (group 1) not treated with oxytetracycline; 7 cholera patients (group 2) treated with oxytetracycline; and 7 controls (group 3).

None of the cases of cholera showed any evidence of abnormal susceptibility of the red cells to mechanical trauma, the average fragility showed no significant difference among the different groups; and there was no significant rise in the concentration of sodium chloride at which initial hæmolysis took place (see table). Only 3 cases in group 1, 0 in group 2, and 2 in group 3 showed initial hæmolysis at a saline concentration just above 0·46%, which is usually taken as normal.

3 of the patients in group 1 had hæmoglobinæmia with plasma-hæmoglobin levels of 180, 180, and 138 mg. per 100 ml., and the plasma-hæmoglobin done on the second day in a 4th patient was 96 mg. per 100 ml. The hæmoglobinæmia disappeared by the next day after it was discovered. Including the case reported earlier (De et al. 1952b) 5 cases of hæmoglobinæmia in cholera have been reported. Of these 5 cases 3 had hæmoglobinuria also; in the 4th patient the first sample of urine voided after the period of anuria was not obtained; and the 5th patient died before passing urine. It is the first sample of urine that is likely to contain the largest amount of the abnormal pigment, which tends to disappear rapidly from the succeeding specimens. Of the 5 patients with hæmoglobinæmia 3 died later of postcholeric uræmia (between the eighth and the tenth days); 1 died in the stage of shock; and 1 had an uneventful recovery.

Discussion

All the cases of cholera, whether they were treated with oxytetracycline or not, had hyperbilirubinæmia, which was greatest on the second day. The absence of a yellowish colour in the cholera stool suggests biliary obstruction as the cause of the hyperbilirubinæmia; but a negative immediate direct van den Bergh reaction excludes this possibility. The hyperbilirubinæmia must therefore be due either to retention of a normal amount of bilirubin from anoxic or toxic injury to liver cells or to an excessive formation of bilirubin from abnormal breakdown of red cells, or to both causes.

The maximum rise of serum-bilirubin on the second day, and the persistence of hyperbilirubinæmia on the fourth day (when the patient has recovered from shock and hæmoconcentration), together with the absence of prompt bilirubin in the serum, make it unlikely that toxic or anoxic hepatic injury is a cause of the raised serum-bilirubin. The absence of any significant histological changes in the liver of patients dying of cholera also supports this contention, although such a possibility cannot completely be ruled out. On the other hand, the occurrence of frank hæmoglobinæmia and/or hæmoglobinuria in 5 cases leaves no doubt about the cause of the hyperbilirubinæmia which was subsequently observed in them, and suggests that a relatively milder and slower process of hæmolysis may explain the rise of serum-bilirubin in the others.

Cohnheim (1892) considered the possibility of red-cell damage, hæmolysis, and hæmoglobinæmia in cholera when he observed that the plasma contained potassium salts. d'Herelle et al. (1930) also emphasised the important rôle of hæmolysis in cholera, though on less secure observations, and Rogers (1922) regarded hæmolysis as the cause of coloured serum in some of his worst cases. Awny (1948) observed an increased icterus index in only a small proportion of cases of cholera, and attributed it to hæmolysis.

A low chloride content was suggested by Rogers (1922) as the cause of hæmolysis with coloured serum in cholera. Banerjee (1941) recorded very low plasma-chloride levels in cholera even after the administration of saline solution. More recently Saha and Das (1951) have reported hypochloræmia in cholera before the administration of saline solution. However, of their 22 bacteriologically proved cases 17 had plasma-chloride levels above 0·46 per 100 ml. In our study of the fragility of red cells no trace of hæmolysis was seen above this concentration in most of the cholera cases. Therefore a low plasma-chloride level can hardly be held responsible for the hæmolysis in cholera.

Awny (1948) believed that the fragility of the red cells was increased by cholera toxin or by the mechanical trauma resulting from dehydration and increased viscosity of the blood. We, however, have not detected any abnormal fragility of washed red cells either in hypotonic saline solution or after mechanical trauma. Moreover, Cooray and De (1949) have shown that the subcutaneous injection of hypertonic glucose solution sufficient to induce considerable hæmoconcentration in rabbits does not produce any significant alteration in the red cells or any hæmolysis. Further, in our controls in group 3, with equal if not greater hæmoconcentration, no hyperbilirubinæmia was found. These facts suggest that dehydration with its consequences cannot explain the hæmolysis noted in cholera.

OXYTETRACYCLINE

We have previously discussed the possibility that a hæmolysin produced by *V. choleræ* destroys red cells (De et al. 1952b). The effect of oxytetracycline on the rise of serum-bilirubin level on the second day supports this hypothesis. Oxytetracycline has been found by De et al. (1952a) to exert both bacteriostatic and bactericidal action against *V. choleræ* in vitro, and clinical reports (Konar and Sengupta 1951, Das et al. 1951, 1953) also suggest that the stools become vibrio-negative earlier in cases treated with oyxtetracycline than in controls. These reports indicate that the antibiotic may influence the serum-bilirubin level in cholera through its adverse effect on the vibrios and thus on their production of hæmolysin. De et al. (1954) have also observed that *V. choleræ* produces a thermolabile hæmolysin which acts on human red cells only in the presence of calcium salts, and that the typical hæmolytic activity is also exhibited by samples of cholera stool yielding a pure growth of *V. choleræ*.

The present study was made at the height of a cholera epidemic, and random cases were selected for investigation; hence the incidence of hæmoglobinæmia recorded here may be shown to be too high when a larger number of cases are collected throughout the season. Of the 5 patients with hæmoglobinæmia 4 died, whereas only 1 of the 26 others did. It would be unwise to generalise from this limited observation, but it indicates a grave prognosis for cases with excessive hæmolysis and consequent hæmoglobinæmia. Further, the development of postcholeric uræmia in 3 of the 4 fatal cases of hæmoglobinæmia suggests that there is a significant relation between the two conditions (see De 1953).

The effect of oxytetracycline therapy on the serum-bilirubin level in cholera is interesting. We did not start with the idea of assessing the success or otherwise of such therapy but we found incidentally that the cholera patients not exhibiting a sharp rise of serum-bilirubin on the second day had been given oxytetracycline.

The clinical reports cited above hold out very little promise of success for oxytetracycline therapy in cholera, although the vibrios in the stool disappear rather earlier. Nevertheless the present study of a small number of cases suggests this antibiotic has some definite beneficial effect on at least one, perhaps ominous, pathological process going on inside the body in cholera. Perhaps higher doses given more frequently, especially at the onset of the illness, would have more obvious clinical results.

Conclusions and Summary

30 bacteriologically proved cases of cholera, of which 23 were treated with intravenous saline solution alone and 7 with oxytetracycline also, exhibited hyperbilirubinæmia, which is ascribed to intravascular hæmolysis induced by the hæmolysin of *Vibrio choleræ*. Controls without cholera but with diarrhœa and a comparable degree of hæmoconcentration did not show this change.

Oxytetracycline seems to prevent a rise of the serum-bilirubin level to a peak on the second day.

Hæmoglobinæmia with or without hæmoglobinuria was observed in 4 of these 30 cases of cholera and in 1 reported earlier (De et al. 1952b). The prognosis of such cases appears serious.

The initial hæmoglobinæmia and hæmoglobinuria may play an important part in the subsequent development of postcholeric uræmia.

The incidence and the effects of these hæmolytic phenomena should be studied in a larger number of cholera cases.

We are indebted to Dr. A. K. Duttagupta for permission to publish, and to Dr. A. Mondal, medical officer in charge of the infectious diseases wards, for help in collecting the materials from his cases. Messrs. Chas. Pfizer supplied the oxytetracycline.

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PLASMA-INSULIN ACTIVITY IN HYPOPITUITARISM

ASSAYED BY THE RAT-DIAPHRAGM METHOD

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THE insulin activity of plasma from acromegalic patients, assayed by a modification of the rat-diaphragm technique originally described by Groen et al. (1952), has been shown to be significantly greater than the insulin activity of normal human plasma (Randle 1954).

The results of similar assays of plasma-insulin activity in three authentic cases of hypofunction of the anterior lobe of the pituitary gland are presented here.

The methods, procedure, calculation, and expression of results have been described previously (Randle 1954).

The results of these experiments are presented in the accompanying table. The insulin activity of plasma from patients with hypopituitarism was significantly

* In receipt of a full-time grant from the Medical Research Council.

INSULIN ACTIVITY OF PLASMA FROM NORMAL PEOPLE AND PATIENTS WITH HYPOPITUITARISM

Case no.	Type of subject	Blood-sugar level (mg. per 100 ml.)	Glucose uptake (mg. per g. per hr.) in the presence of			Calculated plasma-insulin activity (milliunits per ml.)	Limits of error P = 0·05	N
			Buffer	Buffer + insulin (2 milliunits per ml.)	Buffer + plasma (plasma diluted 1 : 4)			
1–7	Normal	..	..	3·96	4·20	13·5	12–20	75
A	Hypopituitarism	80	2·41 ± 0·17	3·31 ± 0·20	*2·47 ± 0·11	..	..	12
B	,,	110	2·22 ± 0·21	4·01 ± 0·20	2·89 ± 0·18	0·57	0·22–1·5	12
C	,,	77	2·35 ± 0·14	3·84 ± 0·39	2·82 ± 0·12	0·77	0·28–2·9	10

* With this single exception, all glucose uptakes in the presence of insulin and of plasma were significantly greater than the basal glucose uptake.
N, total number of hemidiaphragms used for determining the mean glucose uptake in the presence of plasma and of insulin.
The figures for normal human plasma are the mean values for seven separate determinations. The individual values have been previously published (Randle 1954).
Plasma in case A was collected 3½ hr. after oral glucose 50 g.; in the other cases it was collected 2½ hr. after oral glucose 50 g.

less than the insulin activity of plasma from normal people. This difference does not necessarily mean that the insulin content of plasma from patients with hypopituitarism is less than that of normal human plasma; for Ottaway (1953) observed that small amounts of growth hormone had an insulin-like effect in vitro on the utilisation of glucose by the rat diaphragm, and the level of growth hormone in plasma from patients with hypopituitarism is likely to be low. The nature of the material responsible for the insulin-like activity of human plasma in the rat-diaphragm assay has yet to be satisfactorily determined, but these results and the results of similar studies in acromegaly (Randle 1954) suggest that the level of this material in the plasma is influenced by the activity of the pituitary gland.

The possible use of this technique in the diagnosis of hypopituitarism and in assessing the activity of the disease process in acromegaly is being investigated further.

Park (1952) and Bornstein (1953) have attributed the insulin-like effect of normal rat plasma in the rat-diaphragm assay for insulin to non-specific effects of plasma-protein. The results presented here show clearly that this hypothesis cannot explain the insulin activity of human plasma in the rat-diaphragm assay, since plasma samples from two authentic cases of hypopituitarism showed diminished insulin activity in the rat-diaphragm assay despite their normal protein content.

I wish to thank Prof. F. G. Young for much helpful advice and criticism during these investigations; Dr. L. C. Martin, of Addenbrooke's Hospital, for permission to study cases A and C; Prof. M. L. Rosenheim and Dr. J. D. N. Nabarro, of the medical unit, University College Hospital, London, for permission to study case B and for assistance in the study of this patient; Dr. N. R. Lawrie, of the John Bonnett Clinical Laboratories, Addenbrooke's Hospital, for plasma-protein determinations in cases B and C; and Miss D. Cope for technical assistance in the assays. The cost of this work was largely defrayed by an expenses grant from the Medical Research Council. Messrs. Boots Pure Drug Co., Ltd., supplied the crystalline insulin.

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A SENSITIVE DIGITAL PLETHYSMOGRAPH

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ALTHOUGH the most frequent presenting complaint of a patient with peripheral obliterative vascular disease is intermittent claudication, the deficiency in the blood-supply to the muscles rarely leads to loss of the affected limb. It is impairment of the blood-flow to the skin of the extremity that produces at first nutritional changes, then gangrene of the digits, and finally loss of the digits or the limb by amputation.

Thus it is of the greatest practical importance to be able to assess the blood-flow in that part of the limb in which obliterative arterial disease has the most serious consequences—i.e., the digits. The greatest limiting factor to date has been the lack of sensitivity of the available plethysmographs. This limitation has been overcome largely by taking advantage of the high sensitivity of the R.C.A. transducer tube (no. 5734). The possibilities of using this sensitive valve have been explored previously (Burton 1953, Clamann 1951), but more recently workers have felt that the electric circuits required such a high degree of stabilisation as to make them clinically unpractical (Simeone et al. 1952). Studies in this laboratory have led to the incorporation of the valve into a stable electric circuit, and the mechanical alterations produced by the pulse wave are converted into electrical changes, suitably amplified and photographed. This plethysmograph has proved stable, sensitive, and practical for the clinical study of the character and responses of the digital pulse waves in the fingers and the toes of normal people and of patients with disorders of the peripheral arteries.

Apparatus

The device is an R.C.A. 5734 transducer valve coupled to a light aluminium diaphragm 2 in. in diameter and 0·008 in. thick. The valve forms part of a valve-voltmeter circuit driven by suitably stabilised high-tension (H.T.)

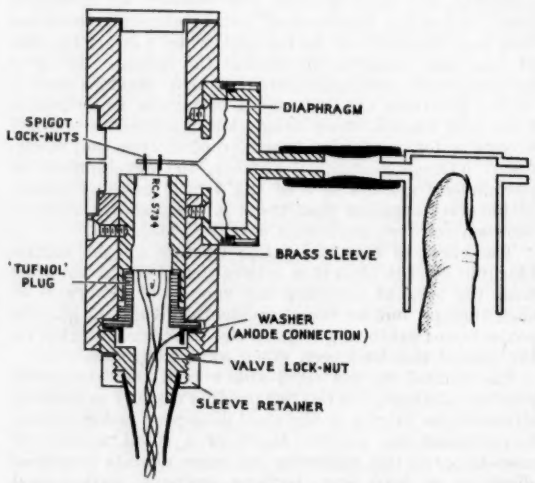

Fig. 1—Details of pick-up assembly.

and low-tension supplies. Details of the construction of the pick-up are shown in fig. 1. Although they are simple, considerable care must be exercised in construction to secure very close tolerances between the valve and the brass sleeve, and between this sleeve and the outer case. In particular, care must be taken to avoid rotation of the valve, and the method of construction prevents this without distortion of the valve.

The valve spigot must be clamped to the diaphragm with the amplifier adjusted to maximal sensitivity and set to zero, thereby avoiding mechanical distortion. The locking nuts are sealed to the diaphragm spindle with shellac.

Since the transducer valve is essentially a miniature triode whose plate is mechanically adjustable with reference to the cathode and grid, it may be considered as a variable resistance forming with its anode load a potential divider network across the H.T. supply. With small angular movements of the anode control spigot the change in output voltage or divider network potential is substantially linear. This movement is necessarily small and does not exceed $\pm$ 0·5°. Under influence of this movement and with an anode load of some 75,000 ohms the output expected is $\pm$ 20 V. It will be noticed that the output is phase-sensitive. A normal valve voltmeter of cathode-follower type is used, half the circuit being directly coupled to the transducer anode, and the

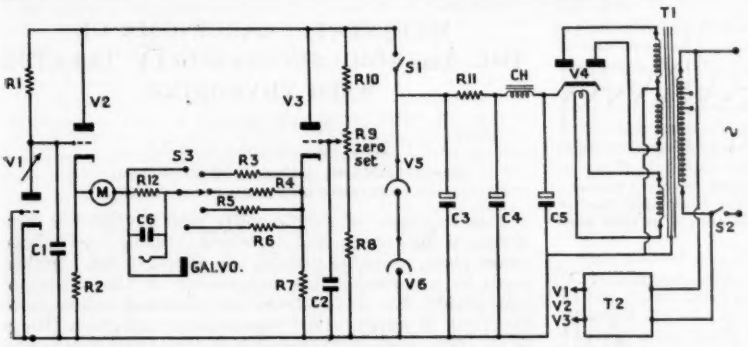

Fig. 2—Circuit diagram of valve-voltmeter, transducer, and power supply.

R1 = 100,000 ohms (H. stab.).
R2 = 50,000 ohms (H. stab.).
R3 = 680 ohms (1/2 w.).
R4 = 3200 ohms (1/2 w.).
R5 = 33,000 ohms 1/2 w.).
R6 = 150,000 ohms (1/2 w.).
R7 = 50,000 ohms (H. stab.).
R8 = 75,000 ohms (H. stab.).
R9 = 10,000 ohms (W. W. pot.).
R10 = 100,000 ohms (H. stab.).
R11 = 1000 ohms (4 w.).
R12 = 680 ohms (1/2 w.).

C1 = 0·5 μF (tub.).
C2 = 0·5 μF (tub.).
C3 = 8 μF (400 v. elec.).
C4 = 16μF (400 v. elec.).
C5 = 8 μF (400 v. elec.).
C6 = 25 μF (25 v. elec.).
CH = Gardner's C246 (10H, 60 mA).
T1 = Gardner's R106 (250–0–250 v., 60 mA, E.T.C.).
T2 = 'Advance' constant voltage transformer.
S1 = H.T. on-off.
S2 = Mains on-off.
S3 = Sensitivity switch.

V1 = R.C.A. 5734 transducer.
V2 = 1/2 6SN7
V3 = 1/2 6SN7
V4 = 6X5
V5 = VR 105–30.
V6 = VR 150–30.
Galvo. = 35 ohms, 2·5 mm. per μA at 1 m.
M = 0–500 μA centre zero.

other half being coupled to a balance potential obtained from the H.T. line via a variable potentiometer forming a zero control (fig. 2).

Any change of anode voltage at the transducer due to spigot deflection will cause a shift in the current distribution of the valve-voltmeter arrangement, and an out-of-balance voltage will appear at the cathodes. If the galvanometer of the recording camera is then connected between these cathodes with a suitable resistance in series, the light beam will be deflected proportionally to the out-of-balance voltage produced by the change of voltage in the transducer anode. By the use of a variable series resistance the galvanometer deflection may be set to a convenient magnitude, and the incorporation of a series of switched fixed values of resistance produces a variable sensitivity control. With the diaphragm in use and a 100,000 ohms anode load with a H.T. line of 255 V a volume displacement of 0·1 c.cm. produced a voltage change of 1·75 V at the transducer anode.

To obtain stability of the valve-voltmeter circuit the H.T. supply is gas-tube stabilised and the heater fed from a constant-voltage transformer, because the transducer valve is particularly susceptible to variation in the heater. To facilitate adjustment of zero control a centre zero meter of 500 μA full-scale deflection is connected in series with the galvanometer.

The apparatus is completely stable at low sensitivity—i.e., in the range of 0·25–0·001 c.cm.—but thereafter some instability develops. Random changes of temperature of the air column in the transducer head and connecting tubes, together with thermal drift of the valve, are partly responsible. Local alterations in the pressure of the environment are even more important, but with care these can be minimised. Calibration has been done with a Burroughs Wellcome microsyringe. Comparison with the Goetz (1949) plethysmograph indicates that the accuracy of this calibration is virtually unaffected by any build-up of pressure within the closed system. The over-all response is substantially linear over a range of volume displacement between 0·25 and 0·0004 c.cm. and from zero frequency to 15 cycles per second (fig. 3).

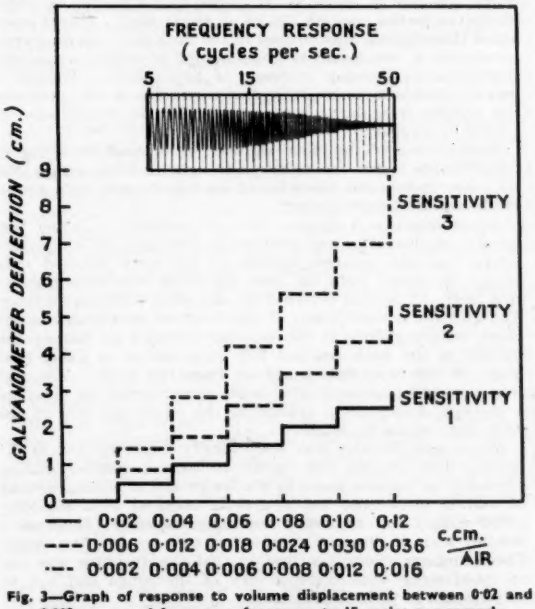

Fig. 3—Graph of response to volume displacement between 0·02 and 0·002 c.cm. and from zero frequency to 15 cycles per second.

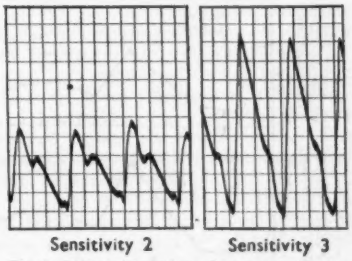

Fig. 4—Pulse volumes from finger-tip in healthy people at sensitivities 2 and 3.

Clinical Observations

The digit being studied is enclosed in a metal collecting cup sealed to the finger or the toe with 'Sealastik,' * which does not cake or constrict, and therefore does not interfere with the blood-flow. Thick-walled fine-bore rubber pressure-tubing leads to the transducer mount. When blood-flows are being calculated, a venous-occlusion collecting cuff is placed at the base of the digit being studied, or, in special circumstances, when the flow is exceedingly rapid, at the wrist or the ankle with due recognition of the error so incurred (Cranley et al. 1952, Goetz 1946, Wilkins et al. 1938). The pulse-volume deflections are expressed in c.mm. per 10 c.cm. of digit, and the blood-flows in ml. per 100 c.cm. of digit a minute. Air conduction has proved quite satisfactory, and the sensitivity is such that it fails to detect a recordable pulse volume or blood-flow only in the

* Manufactured by Expandite Ltd., Cunard Road, London.

Fig. 5—Resting pulse volume in toe in patient with Buerger's disease : *a*, at rest before operation ; *b*, twenty-four hours after lumbar sympathectomy ; *c*, on second postoperative day ; *d*, on sixth postoperative day.

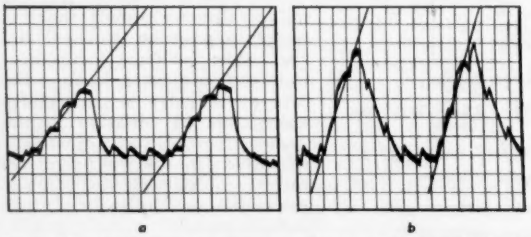

Fig. 6—Blood-flow shown by venous occlusion : *a*, before cervicodorsal sympathectomy in Raynaud's disease ; *b*, on fifth postoperative day.

presence of advanced arterial obliteration or severe arterial spasm, when a functioning circulation in the digit is, for all practical purposes, non-existent.

The pulse volume from the finger-tip of a healthy person is illustrated at two sensitivities in fig. 4, and from the toe of a patient with Buerger's disease before and after lumbar sympathectomy in fig. 5. Blood-flows obtained by the venous-occlusion method are illustrated before and five days after cervicodorsal sympathectomy for Raynaud's disease in fig. 6. The digital blood-flows and pulse volumes are plotted against each other in fig. 7 before and after ulnar-nerve block in a patient with advanced sclerodactyly. The close relationship between the two is apparent—a fact that has been confirmed by Burton (1939).

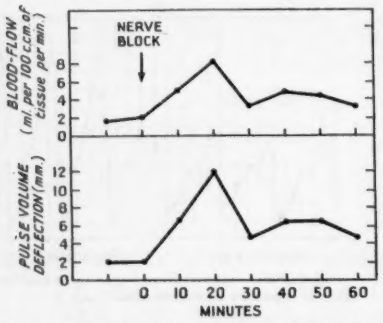

Fig. 7—Digital blood-flow and pulse volume before and after ulnar-nerve block.

The plethysmograph described here has been under study in this laboratory for more than a year, and during this time it has satisfied the requirements of stability, sensitivity, and accuracy. The same transducer valve has been in constant use in this period, which is proof of its ruggedness unless grossly mishandled. Finally, the valve is inexpensive and easily assembled, and replacements are readily obtained.

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METASTATIC CARCINOMA OF THE THYROID SUCCESSFULLY TREATED WITH THYROXINE

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THE treatment of simple goitre with thyroid has been reviewed by Greer and Astwood (1953). Shrinkage takes place, probably because the administered hormone leads to a corresponding suppression in the output of the gland. No toxic effects are observed unless doses in excess of physiological requirements are given (Riggs et al. 1945, Greer 1951, Danowski et al. 1952, Perlmutter et al. 1952).

Carcinoma of the thyroid gland is not likely to respond in the same way as simple goitre unless it is well differentiated and still depends to some extent on pituitary thyrotrophic hormone. In the case described here a highly differentiated tumour, with widespread pulmonary metastases, was shown to depend on thyrotrophic hormone and responded favourably to prolonged medication with sodium-l-thyroxine.

Case-report

A woman, now aged 40, was first seen twenty-one years ago with a painless lump in the right side of the neck, thought to be a tuberculous gland. This was treated by radiotherapy without effect. Fifteen years ago a second and smaller lump was noticed, nearer to the midline on the same side. Eleven years ago slowly increasing dyspnœa on exertion was first noticed, and eight years ago mass radiography revealed widespread mottling throughout both lung fields. This mottling has very slowly progressed during the succeeding years. Four years ago the patient was admitted to Woolwich Memorial Hospital, where the first lump was excised ; on section this was found to consist of apparently normal thyroid tissue. The second lump was then excised and showed the same histology. Since it seemed probable that these represented local metastases of carcinoma of the thyroid, total thyroidectomy was done, but no neoplastic focus could be identified in the excised gland. The patient was then referred to St. Bartholomew's Hospital for radiotherapy, under the care of Mr. I. G. Williams, and a course of 5500r was given to the neck at 250 kV in thirty days. Three years ago a third nodule was noticed in the neck and was removed ; on section it was found to be composed of colloid-containing thyroid acini showing evidence of hyperplasia. Though it was impossible to diagnose thyroid carcinoma in the specimen, the cellular irregularity was greater than is usually seen in simple hyperplasia.

Radiography of the chest showed widespread mottling of innumerable small metastases throughout both lungs, but no other metastases were found elsewhere, and radiographs of the skeleton were normal.

Investigations.—A tracer dose of radioactive iodine was given ; of this 43% was excreted in the urine in forty-eight hours, but the greatest uptake in the neck reached only 10% ; no direct counting over the chest was attempted at this time. A second tracer dose was given five months later. The greatest accumulation of radioactivity was found in the chest, reaching 30% of the dose at twenty-four hours ; the uptake in the neck reached 9% only, and it is likely that much of this was due to scatter from the chest. The test was repeated two days later with carrier iodide to simulate a therapy dose ; 30% uptake in the chest and 9% in the neck were again recorded.

Respiratory-function tests were kindly made by Dr. D. V. Bates. The patient was shown to have a normal mixing efficiency as regards gases in the lungs and a normal uptake of carbon monoxide, but a greatly reduced vital capacity (2190 c.cm.) and maximal breathing capacity (47 litres a minute and 42 litres a minute on two consecutive runs). These findings strongly suggested that the dyspnœa was due to interference with distensibility of the lungs and not to emphysema or to bronchospasm.

Electrocardiography.—An electrocardiogram was normal.

Screening of the chest showed no evidence of enlargement of the right ventricle, but it was felt at this time that a real danger of progressive cor pulmonale was present, although dyspnœa was not yet severe and the patient's general health was still good.

Treatment with radioactive iodine seemed indicated, and on Sept. 11, 1951, a dose of 20 mC was given by mouth. Of this 56% was excreted in forty-eight hours, the uptake in the chest reaching 35% in twenty-four hours. Two months later a fourth tracer dose showed a maximal uptake in the chest of 46% at twenty-four hours, and a second treatment dose was then given, this time of 102 mC. A fairly prolonged radiation sickness followed this, and the patient did not recover normal vitality for about two months. Transient lymphopenia developed but no dangerous depression of the marrow.

A further tracer study on June 19, 1952, nine months after this last treatment, showed that the uptake by the lungs had now risen still further, reaching 56% of the dose at twenty-four hours, with no demonstrable uptake in the neck. Calculation (Oddie 1951) showed that the therapeutic doses should have provided local irradiation of about 10,000 r.e.p. throughout the lungs. It seemed that effective ablative doses of radioactive iodine would have to be prohibitively high, and X-ray therapy also, if an adequate response were to be obtained.

Treatment with thyroxine was therefore started in the hope that the metastases might behave like nodular goitre and slowly regress. L-thyroxine was used because it contains less non-hormonal iodine than does the racemic form, and less than thyroid extract, and would not therefore interfere with any subsequent tracer studies. Sodium-l-thyroxine was started on July 16, 1952, in a dosage of 0·1 mg. daily, which was slowly increased until by Oct. 7 the patient was receiving 1·0 mg. daily, with the production of signs of mild toxicity. The dosage was reduced to 0·7 mg. daily, at which level no symptoms were produced, and the patient was then readmitted for further tracer studies. On Dec. 15, 1952, 99% of an intravenous tracer dose was excreted in forty-eight hours, without any demonstrable uptake either in the chest or in the neck. Thyroxine was then discontinued, and four weeks later, on Jan. 12, 1953, the patient was readmitted for further study. She now presented the typical appearance of hypothyroidism; the uptake of radio-iodine in the chest reached 26% of the dose at twenty-four hours, with no demonstrable concentration elsewhere.

Further Progress.—Since then she has been maintained on thyroxine, without intermission, in a dosage of 0·5 mg. daily. There has been a slow but considerable reduction in dyspnœa; the lung-function tests have been repeated and show a rise in the maximal breathing capacity, from 47 litres a minute to 79 litres a minute, although the vital capacity has remained unaltered at 2070 c.cm.; and there is now a slight but definite clearing of the X-ray shadows in the lungs.

Discussion

I am indebted to Dr. G. J. Cunningham for his report on the histology of the local recurrence in the neck. The tumour here was well differentiated, and it is likely that the pulmonary metastases are similar to it. This is confirmed by the ability of the pulmonary metastases to pick up iodide, as the tracer studies showed; and the patient's euthyroid state despite total thyroidectomy was presumably attributable to their activity.

The suppression of iodide uptake after treatment with thyroxine parallels that observed in healthy people both in its degree and in its duration (Greer 1951, Morgans et al. 1952). It was followed by a phase of rebound hypothyroidism, as in healthy people (Farquharson and Squires 1941). It is reasonable to suppose that the mechanism of this lies in the suppression, by the administered hormone, of the pituitary output of thyrotrophic hormone, as in healthy people, and the resultant diminution in activity of the thyroid gland. This would indicate the dependence of the pulmonary thyroid tissue on normal thyrotrophic stimulation from the pituitary.

Regression of the metastases after treatment with thyroxine was shown by clinical improvement, with lessening of dyspnœa subjectively and a better performance of objective tests of lung function; and it has been confirmed by definite clearing of the X-ray shadows in the lungs. (I am indebted to Dr. G. Simon for the interpretation of these films.)

Summary

A case of well-differentiated thyroid carcinoma is described in which very numerous functioning deposits in the lungs proved resistant to treatment with radioactive iodine, but now appear to have been satisfactorily suppressed as a result of prolonged treatment with thyroxine.

This patient was in the first place under the care of Mr. I. G. Williams, and my thanks are due to him and to Dr. A. E. Jones for permission to publish her case. As an inpatient she was under the care of Prof. R. V. Christie, to whom I am grateful for permission to publish and for help with the preparation of this paper. The radio-iodine studies were undertaken by the Department of Physics, and I am indebted to Prof. J. Rotblat and to Mr. G. M. Owen for the great deal of careful work they have done.

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Preliminary Communication

TOXOPLASMOSIS IN CHILDHOOD

PATIENTS with unexplained pyrexia of 7–10 days' duration accompanied by generalised lymphadenopathy and sometimes by a rash and splenomegaly are commonly seen in the outpatient department of a children's hospital. A blood-count shows a leucocytosis of 10,000–15,000 per c.mm. with an increase in the proportion of polymorph cells, a threefold or fourfold increase in the absolute eosinophil-count, and no "glandular fever" cells. The Paul-Bunnell test is negative despite a reasonable clinical diagnosis of infectious mononucleosis.

Throughout the world it has been found that up to 50% of apparently normal adults have a positive dye test for toxoplasmosis, while less than 10% have complement-fixing antibodies. In toxoplasmosis the complement-fixation test is believed to become positive later, and its titre to fall more quickly, than does the dye test. Although domestic animals are presumed to be the reservoir of infection, apart from congenital toxoplasmosis little is known of how or when man becomes infected with toxoplasmas or whether the initial exposure to the parasite, leading to the production of antibodies, is invariably unassociated with symptoms.

The lack of explanation for the numbers of cases of children with pyrexia and lymphadenopathy, and their resemblance to known cases of acquired toxoplasmosis,

RESULTS OF DYE TEST AND COMPLEMENT-FIXATION TEST IN 20 CASES OF CHILDREN WITH UNEXPLAINED PYREXIA AND LYMPHADENOPATHY

Case no.	Dye test (titre)	Complement-fixation test (titre)
1	1/512	1/32
2	1/32	1/32
3	1/64	1/16
4	1/256	1/16
5	1/64	1/64
6	1/64	1/16
7	1/256	Anticomplementary
8–20	Negative	Negative

led me to wonder whether this condition might represent the first, antibody-stimulating exposure to toxoplasmas, resembling a primary tuberculous complex.

INVESTIGATION

Sera from 20 children and young adults suspected on clinical grounds of having glandular fever were all found to give a negative Paul-Bunnell test. Toxoplasma dye and complement-fixation tests were made, and the findings are shown in the accompanying table.

COMMENT

These results were unexpected, because of both the number of positive findings and of the high titres. It is still difficult to know, in the absence of recognised signs of toxoplasmosis, what attention to pay to positive serological findings, but a titre of 1/8 for the complement-fixation test is generally regarded as of some diagnostic significance. Of the 20 cases 6 had titres in excess of this; while in a 7th case where the serum was anti-complementary the dye-test titre was 1/256—four times as high as that usually found in the symptomless adult.

These preliminary findings are far too incomplete for any firm conclusions. A much larger series of cases of glandular enlargement must be investigated, and a long follow-up is being undertaken to observe changes in antibody titre. Also the hæmatological findings must be accurately correlated with the serological. But the present data do lend support to the belief that some, at least, of the cases of apparently non-specific generalised lymphadenopathy with pyrexia in children may be due to toxoplasma infection, and that the positive serological tests so often found in the symptomless adult may be a residuum of such infection.

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Reviews of Books

Rh-Hr Blood Types

Applications in Clinical and Legal Medicine and Anthropology. ALEXANDER S. WIENER, M.D., F.A.C.P., senior serologist to the office of the chief medical examiner of New York City. New York: Grune & Stratton. 1954. Pp. 763. $11.50.

An Rh-Hr Syllabus

The Types and their Applications. ALEXANDER S. WIENER. New York: Grune & Stratton. 1954. Pp. 82. $3.75.

BETWEEN 1929 and 1953 Dr. Wiener and his co-workers published 333 papers on the Rh-Hr blood types. The first of the two volumes reviewed here gives a full list arranged in years. The papers have appeared not only in the United States but also in British, French, and Italian journals and some others. From these numerous and often important writings Dr. Wiener has selected 84 to represent his contribution to every aspect of the subject. As they have been reproduced from the originals by a photographic process, the book inevitably contains a mixture of sizes and shapes of type which makes for difficult reading; sometimes the reproduction is not too clear and some of the more complex tables need a magnifying-glass. It may be useful to have this collection under one cover, but the relatively few experts directly interested in the subject are likely to have read the principal papers already and probably possess reprints. The non-expert will hardly tackle so difficult a set of papers, and in his *Rh-Hr Syllabus* Dr. Wiener himself has in fact provided them with a much shorter and simpler account of his work.

The *Syllabus* is an excellent little monograph, containing all that anyone not actually pursuing research into blood-groups needs to know about the Rh-Hr blood-group system and the pathological conditions in which it is concerned. It begins with a series of definitions of fundamentals, and the next two chapters, on Rh antibodies and on the serology and genetics of the Rh-Hr types, contain short didactic discussions, illustrated by clear diagrams. A fairly long and remarkably informative chapter on erythroblastosis fœtalis is followed by short chapters on blood-transfusion, anthropology, and medicolegal applications. Unfortunately Dr. Wiener's views on nomenclature introduce difficulties for many of the readers who would benefit most from his book. In this country the CDE nomenclature is in everyday use; but, as is well known, Dr. Wiener regards it as misguided and misleading, and will have none of it. As things stand, the ordinary student needs the help of books that, unlike Dr. Wiener's, make a fair job of collating the two systems. But it is a measure of his skill that he makes his subject plain despite the complexity of the notation which the devotees of the theory of multiple alleles find necessary for the expression of their ideas.

Spot Diagnosis

Volume 1. Compiled by the Editors of *Medicine Illustrated.* London: Harvey & Blythe. 1954. Pp. 128. 7*s.* 6*d.*

THIS is an entertaining and teasing book. The reader is invited to examine a photograph and consider some clues; he must then make a diagnosis, and answer some questions, before turning to the right answer on the next page (rather too handy for those who readily succumb to temptation). Most of the pictures have appeared under similar examination conditions in *Medicine Illustrated.* The game is both instructive and aggravating; for the baffled diagnostician learns from his mistakes, yet complains that he would have done better, of course, in the flesh or with a coloured photograph. And he may be annoyed when a non-fluctuant swelling turns out to be a cold abscess, even though the answer generously excuses him from blame in this case. One or two of the conditions are on the rare side, but then many of the commoner diseases do not lend themselves to this form of demonstration. The answers include brief notes on diagnosis and treatment, and at the end of the book there are summaries of some recent developments in medical treatment. This volume is the first of a series.

Medical Electronics

G. E. DONOVAN, M.D., M.SC., D.P.H. London: Butterworth. 1953. Pp. 215. 30*s.*

THE aim of this book is "primarily to provide a bird's eye view of the uses of electronics in medicine." The list of contents is impressive, including such subjects as X rays, radioactive isotopes, television, electron microscopy, amplifiers, phono-electrocardioscopy, electromyography, servo mechanisms, and cybernetics. But in his effort to cover so much ground so quickly the author does not always carry the reader along with him.

Much electronic terminology is used without additional or simplifying explanation: "the p-n-p junction triode," "frequency selector and clipper, pulse shaper and delay circuit," and "the usual arrangement of push-pull stages with cathode degeneration of in-phase voltages" are phrases unlikely to convey any clear idea to those not engaged in electronic work. The almost complete absence of cross-references is tiresome: thus a porous-plug transducer is mentioned on p. 88 but not in the chapter on transducers, while gas amplification is not explained in the chapter on photo-electric cells, though the reader is told earlier that gas amplification does not take place in ionisation chambers.

The illustrations are of mixed quality: some, such as those in the chapter on electron microscopy, are good, especially the comparison between the electron microscope and the optical microscope; others, showing merely the outside appearance of cabinets, are unhelpful. Dr. Donovan believes that detailed circuit diagrams are not necessary for an understanding of the principles involved in an apparatus, and that may be so; but there is still a real need for the imaginative use of block schematic diagrams.

The preface suggests that doctors who are not already familiar with the applications of electronics to medicine may find the book of interest; but those who are not well versed in electronic teminology will find much of it perplexing—though they may profit from the accounts of the various applications. Physicists, research-workers, and electronic engineers will find some useful references.

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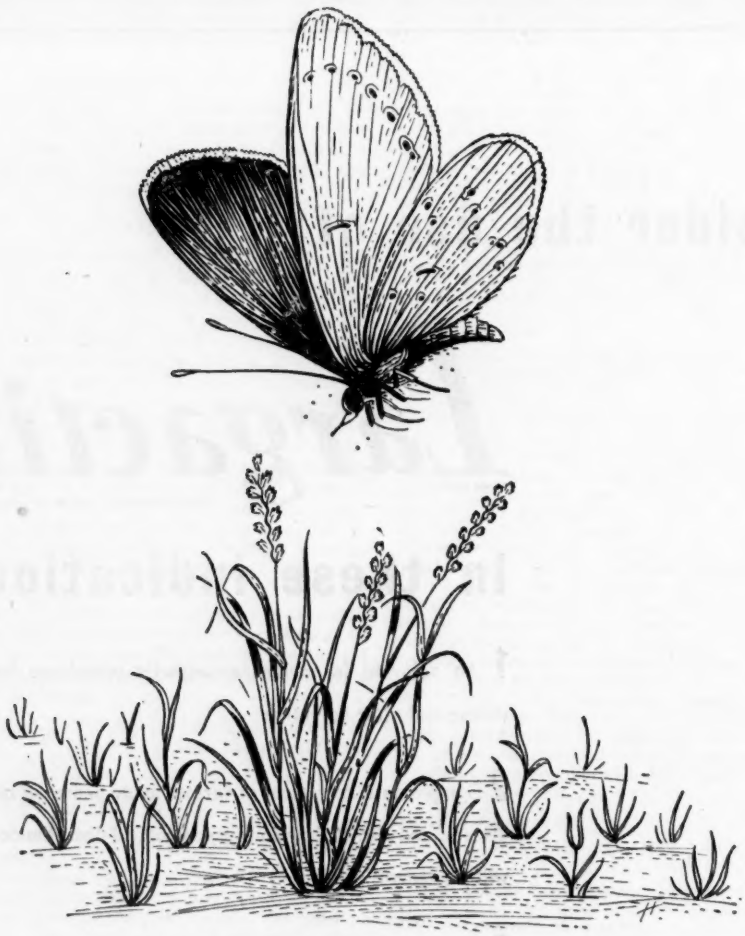

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THE LANCET
LONDON: SATURDAY, APRIL 17, 1954

The Bombs

THE terrific explosion of the hydrogen bomb last month was one of those dramatic events that display a dangerous situation and compel us to consider where we are going. Absorbed though we may be in our own affairs, we have to adjust our minds to the probability that if there is another world war this weapon will be used on our behalf. For many millions this probability means that they must examine afresh their opinions on the ethics of war.

In such an examination we may begin by noting that within almost all human groups the members are forbidden to kill each other. Man is a social animal whose success has generally depended on the support of his fellows, and, whether the group is small or large, homicide within it is regarded as a crime—often, as in our own country, as almost the gravest of crimes. On the other hand, there is no social objection to the destruction of an enemy *outside* the group: on the contrary, when two groups are at war, the very code of loyalty which prevents internal killing enjoins external killing, and the aggressive violence which is criminal at home becomes meritorious abroad. Moreover, so strongly social are mankind—so devoted to their own group—that to the large majority this apparent anomaly of conduct comes quite naturally; and they will go to equal lengths to kill their foes or to save their friends. Distinguishing thus sharply between "our side" and the others, they readily extend protection to anyone who wants to join their group—even yesterday's enemy. Indeed civilisation has been made possible only by the formation, in this way, of larger and larger groups whose members feel that in essentials they are all on the same side, and who therefore accept a code which stops them from killing each other.

In the past fifty years this process of social coalescence has gone on much faster—so much so that in the present Cold War most of the nations belong to one or other of two opposing groups, not unevenly matched in numbers. The more hopeful among us take comfort in the thought that the creation of these two immense groups, each securing peace within its borders, may be the last stage on the way to the creation of a single world community—a community of which every human being is a member, and whose protection he enjoys. Through the centuries this goal of human unity has been set before us alike by the idealist and by the realist—the one asserting the brotherhood of man, the other demonstrating the artificiality and impermanence of the political and racial boundaries which appear so formidable. (Both in this idealism and in this realism no small part has been played by our own profession, whose members, in undertaking to do their best for any man, woman, or child at any time, have reflected, however imperfectly, the best of Christian teaching and Greek thought). Given time, there can in fact be little doubt that these ideas will be accepted: the remaining groups will in one way or another be fused, and thenceforward only those who are outcast from the world community will feel justified in taking the lives of others of their own species. But we do not know when or how this will happen: and meanwhile the division of the world into two major groups means that though we have far more potential friends we also have far more potential enemies. Nor has our progress towards a World State in the future lessened the antagonism, or civilised the methods, with which war is waged in the present. On the contrary, our struggles have become more intense; having begun to fight, we find it harder to break off the engagement and reach an honourable settlement; and our techniques of killing, though in some ways less horrible than our ancestors' personal use of fire and sword, have a recklessness which suggests a blunting of moral values. Certainly the conventions of war have changed astonishingly within a few decades.

To the primitive member of a group, the declared enemy is always something to be destroyed, and the more thoroughly the better. We have lately witnessed dreadful examples of such barbaric warfare. But human societies have never consisted entirely of mental myopes, and even before the time of the greatest religious teachers many nations adopted conventions designed to prevent the worst atrocities of war. In Europe Christian influence increased the power of such conventions so greatly that a time came when the right to kill and the methods of doing so were strictly circumscribed by rules; and any combatant breaking these rules exposed himself to the contempt of neutrals. Those who are old enough to remember the earlier part of the first world war may recall the shocks of horror that went through this country at the report that our enemies were using dum-dum bullets, at their shooting a woman for helping prisoners to escape, at their use of poison gas, and above all at their attacks on liners conveying civilians and on hospital ships conveying the wounded. Of all the motives that inspired our nation in 1914–18 none perhaps was stronger than the determination to defeat a country which in these ways flouted the rules of war, and which openly declared that the end justified the means; and it was in the hope of preventing the triumph of such doctrine that great numbers of young men of the Allied Forces gave their lives. In 1939 the cause presented to their successors was not perhaps very different; but this time there was no surprise at our enemy's bombing of open towns, and the minds of nearly everybody were soon adjusted to the policy of retaliation which ended in the destruction of so many Continental cities and so many of the people in them. By the time the first atom bombs were dropped on Nagasaki and Hiroshima we had come a long way from the dum-dum bullet. Rightly or wrongly, we had reconciled ourselves to the annihilation of any member of an opposing group, whether old or young, man or woman, under arms or not. And to annihilation the atom bomb added the possibility that our action would so damage the genes of survivors that our enmity would reach even their descendants.

On the practical rather than the moral plane, the use of new weapons requires further thought because they are becoming so powerful that their effects may

soon be incalculable. Many will be grateful, therefore, to a member of our profession, Prof. ALEXANDER HADDOW, both for his plain statement of the risks now developing and for his proposals for meeting them.[1] The events in the Pacific, he says, bring to an end the notion that the area of danger can have any but relative meaning, and he goes on to speak of the subtler menaces arising from the liberation of radioactive products. "We approach," he thinks, "the time when future risks must be envisaged on a terrestial scale, with more than a hint of new kinds of catastrophe from increased physical incalculability"; and this opinion has since been given further point by the announcement [2] that there is now no obstacle to making "the most dreaded weapon of all"—a cobalt bomb which on explosion is transformed into a radioactive cloud that will travel thousands of miles, destroying all life in its path.

"The solution," Professor HADDOW continues, "is one for statecraft and not for science as such. Yet the issue is so universal, and the Governments of the world are so compromised in their attitudes towards it, that we must despair whether there exists in fact either the mechanism or the will. . . . If all solution is beyond the present means, the question must be raised whether the representatives of world science itself, imbued by some sense of humane responsibility, can assist in the judgment."

"While the crisis is unlikely to be affected by the endeavour of any single individual today, such would not necessarily be so were the issue transferred, under the ægis of the United Nations, to a *concilium* of world science, representing especially physics, chemistry, biology, and medicine, representative also of their nationalities, yet supranational in outlook, of an authority transcending that of the politician, and with an unimpeachable primary loyalty to humanity as a whole. From such a body, and possibly from such a body alone, might we expect a factual appraisal and an advocacy of policy of such overwhelming weight as to commend itself to the whole of the civilized world."

"International relations is clearly not a discipline susceptible to the scientific method, yet it could perhaps be affected by the outlook of science, and some approximation made towards an analysis of the contemporary situation, more objective than those monumental travesties to which, from one side or the other, we are sufficiently accustomed."

Three months ago we suggested that in facing this further year of peril the chief need was to keep a sense of proportion. That need remains; but a sense of proportion is not maintained by pretending that very big things are really quite small. In the discussions of the past few weeks some have argued that an unnecessary fuss is being made about a weapon which is only the latest in a long series of lethal developments in the art of warfare—from the bow and arrow to the bacterial toxin. To this the answer is that in this process of development there are certain profoundly significant points, of which one was the agreement to the mass bombing of cities, another was the first use of atomic fission for the same purpose, and a third is the possibility that we are moving from the indiscriminate to the incalculable. At any such point a pause for thought is proper; and before we teach ourselves to regard the hydrogen bomb as a legitimate means of protecting our civilisation we should consider what effect such protection is having on the civilisation itself. Man often kills the things he loves; and if by civilisation we mean freedom of speech and belief, a good conscience towards others, and a respect for human life and personality, we may find that it is being sacrificed in its own defence. There are indeed already signs of our acquiring a barbarity of thought that makes us unfit to be its defenders.

The moralists say that if an end can be reached only by evil means, that end must itself be evil; and few of us can have any real doubts about the wrongness of wiping out a city or a nation with a bomb. On the other hand the mere existence of this invention is not necessarily an evil, and it may even prove our salvation if it induces the leaders on both sides to consider objectively whether the differences between us really justify and necessitate the continuance of an undeclared war carrying such risks for everybody. At present both sides are strong in armaments but nevertheless afraid; and the reason for their fear is largely that neither ceases for a moment its efforts to undermine the position of the other. Is it too much to ask that, as a first step towards the return of human relations, both should call a truce to this aggressive propaganda? Profoundly though we may disapprove of the Eastern régimes, we should remember that their citizens think they have reasons for no less disapproval of the West; and in trying to preserve a sense of proportion we should not forget that half the nations of the Free World were once our own enemies, either because we hated their tyrannies or because they hated ours. If by curbing our fears and restraining our threats we can avert a conflict which will ruin both worlds, the two different civilisations may be able to live side by side and eventually absorb what is best in each other. On a historical view such coalescence of rival groups is very far from being impossible; and its attainment must be the aim of all who recognise that, for survival, all men must come to regard themselves as members of a single group—in which homicide, by any method, is forbidden.

1. *Times*, March 30, 1954, p. 7.
2. *Ibid*, April 8, 1954, p. 5.

Detection of Tuberculous Contacts

BURIED beneath the mortality-rate and the notification-rate lies the epidemic pattern of tuberculosis, as secret and tenuous as the mycelium of a mushroom-bed. Neither rate gives a reliable map of its ramifications: the deaths have fallen fast in the last five years, the notifications hardly at all, as Dr. TATTERSALL [1] has pointed out in our correspondence columns; indeed in Scotland in 1953 they were slightly higher than in 1952. Nevertheless, the greater the proportion of cases detected, the more informative the notification-rate will become. The situation is complicated by the fact that patients with advanced disease are now living longer and perhaps adding to the risk to other people. Our greater success in making the tuberculous sputum-negative may not offset this as much as we hope if, as Dr. STEWART and Dr. VAN ZWANENBERG suggest in their letter this week, we cannot rely on bacteriology in determining the infectiousness of a particular patient. As things stand, it is still very hard to assess either prevalence or risks. But our lack of a perfect map need not prevent our doing much more than we are doing to contain this disease.

A memorandum from the Ministry of Health,[2] designed to help medical officers of health to review

1. Tattersall, W. H. *Lancet*, April 3, 1954, p. 730.
2. Prevention of Tuberculosis. Circular H.M.(54)30.

their own programmes of control, rightly insists that the chief cause of primary infection is close contact of a susceptible subject with an infected person. Spread from other causes—from inhalation of infected dust, for instance—is nothing like so important. The first job of the preventive team, then, is to find every infected person and notify him. Notification of *every* case discovered, indeed, is an essential contribution to prevention which all clinicians, in or out of hospital, ought to make. For only when a case has been notified can the M.O.H. set about finding out where the patient got his infection and whether he has infected others. The Ministry thinks that if as much effort were put into tracing sources and contacts of tuberculosis as is put into tracing sources of typhoid or contacts of smallpox, we should make faster progress. Contacts should not only be examined: they should be kept under observation for a time to see whether they are incubating the disease, or whether, in common with the index case, they are exposed to a source of infection not yet detected. Children, adolescents, and young adults naturally need the closest supervision; and all tuberculin-negative contacts, of whatever age, should be given whatever protection B.C.G. vaccination confers. Local health authorities are now at liberty to give this vaccine to children about to leave school, and the Ministry has published a circular [3] and memorandum [4] on the subject.

In tracing sources of infection, skin tests can be very useful, and they could be applied much more widely than at present to investigate the family contacts of an infected child, and so to trace the person by whom he was infected, or even the source of infected milk. Surveys of the family contacts of tuberculin-positive school entrants have yielded a high proportion of infected adults; and the Ministry thinks that further studies of this kind would be valuable. Skin testing at other ages may also be informative: thus when a child seen at a chest clinic is found to have a primary infection or adult-type tuberculosis, the skin testing of his class and teachers at school may reveal an unknown case in another child or an adult. Indeed, skin tests could be used, STEWART and VAN ZWANENBERG believe, to map the incidence of infection in various age-groups, and in different schools, throughout the country. This would give us a picture of the black spots, and, as the years go by, a measure by which to judge the success or failure of our attempts to control the disease. In areas where not all milk is pasteurised the discovery of a high proportion of tuberculin-positive children may reinforce a campaign to get rid of bovine infection. Repeated radiographic examination of school staff seems a reasonable precaution, and one to which no teacher ought to object—though it is not always easy to be enthusiastic about an investigation when one's livelihood depends on the result. The Ministry favours the selective use of mass radiography rather than the examination and re-examination of large groups. Patients referred by their general practitioners, and patients attending hospital, give a relatively high yield of positive findings, and it is often useful to radiograph the work group of a patient newly diagnosed at a chest clinic. Similarly the appearance of several cases in one village is a good argument for a survey of the whole population by radiography and skin testing. The Ministry also holds that all pregnant women should be radiographed as part of routine antenatal care.

In short it believes that the M.O.H., the chest physician, the family doctor, and the mass-radiography unit, working together and consulting often, can apply the traditional methods of epidemiology, and the newer techniques of radiology and skin testing, to the detection of the epidemic pattern of tuberculosis in their area. It is particularly important, the memorandum adds, that the general practitioner should be fully informed about what is going on; for without his support the campaign cannot succeed: and indeed its complete success depends on the active collaboration of everyone concerned in the detective work.

3. Circular 22/53.
4. Memorandum 324/B.C.G.

The Sardinian Campaign

IN 1945, when the destructive consumption of war mercifully ceased, the Allied nations diverted their geared-up production and surplus stores to beneficent uses under the direction of UNRRA; in addition, the United States provided dollars to aid recovery in Europe under E.R.P. In the Italian sphere the first call on these materials and funds was for emergency work, such as controlling malaria and other epidemic diseases. But members of the UNRRA mission were anxious to invest some of the funds in work of lasting value. Dr. F. L. SOPER, of the Rockefeller Foundation, proposed a mosquito eradication campaign; and Sardinia was chosen because, being an island, it is a relatively isolated unit and because it was the most malarious part of Italy. Members of the Rockefeller International Health Division had behind them successful eradication campaigns in Brazil and Egypt. They had established that, at least in some circumstances, extensive and vigorous eradication work could obviate the trouble and expense of routine control measures. With this background, it was intended to plunge directly into a similar campaign in Sardinia, relying on administrative experience gained in earlier schemes and on existing knowledge of the Sardinian malaria vector, *Anopheles labranchiæ*.

In October, 1945, UNRRA agreed in principle to the project, which was to be carried out jointly by the Italian government, UNRRA, and the Rockefeller Foundation (which supplied technical staff and extra funds). A special agency known as ERLAAS (Ente Regionale per la Lotta Anti-Anofelica in Sardegna) was set up to conduct the campaign. Delays in assembling staff and equipment deferred the start of eradication work until early in 1947; but this was no misfortune, since it gave time for a survey of the island by a malariologist and an entomologist. By 1947 it was realised that this campaign, aimed at the extermination of indigenous mosquitoes, would be much more difficult than the earlier campaigns, which had dealt with mosquitoes intruding into new territory. Furthermore, the Brazilian schemes had attacked highly domestic strains of mosquitoes which were never found breeding far from man; whereas *A. labranchiæ*, though a man-biter, will readily breed in remote places and feed on wild animals. To offset these difficulties, there was the new weapon of

dicophane (D.D.T.), for attacking both larval and adult mosquitoes. Dicophane house-spraying programmes had substantially reduced malaria in continental Italy and elsewhere; but in these regions the behaviour of the anopheline vectors was very different from that of *A. labranchiæ* in Sardinia. Thus, in the potentially malarious Roman Campagna this mosquito inhabits a relatively crowded agricultural area. The adults readily enter houses to feed and rest, and a high proportion of the mosquito population soon encounters dicophane. In Sardinia, on the other hand, the people live in few compact villages surrounded by wild territory; and most of the adult mosquitoes rest in caves and other natural shelters, safe from residues of dicophane. Accordingly, though the campaign against *A. labranchiæ* in Sardinia included several island-wide house-spraying operations, the main attack consisted in tracing and treating all breeding-places; and in 1948 this attack was extended throughout the island. When it was found that many breeding-places were inaccessible, an enormous army of workmen, numbering up to 30,000, was recruited to clear vegetation and drain swamps so that the 6000 larviciders could treat all sites. A large force of scouts was employed to check the work. Despite all this effort, positive foci of *A. labranchiæ* were found in many places in 1949, and attempts were made to eliminate these by vigorous local attacks. Yet almost as many breeding-sites were discovered in 1950, and when the campaign finally closed in the autumn of that year it had failed in its object.

An ill-natured or ill-informed critic might dwell on the fact that, over a period of four and a half years, some 6700 million lire (about £3 million) had been spent without achieving eradication. But a great deal has been gained; for whereas in 1946 there were 10,000 primary cases of malaria and 75,000 relapses, the disease is now reduced to the vanishing-point. This is no mean gain; for the disease, as well as impairing the health of Sardinians, hindered colonisation of their under-developed island. Perhaps malaria could have been eliminated more cheaply; but in 1945 eradication of the mosquito seemed feasible, and no-one could then predict the outcome. It now seems probable that *A. labranchiæ* cannot be exterminated without quite disproportionate effort and expense, and the Organisation were wise to cut their losses and stop in 1950. The final act of the Rockefeller Foundation has been to produce an account of the campaign, written by Dr. LOGAN,[1] who directed the work for most of the period. It is well that the lessons so hardly learned should be on record, for guidance of the many further anti-mosquito programmes that are afoot.

1. The Sardinian Project: An Experiment in the Eradication of an Indigenous Malarious Vector. By JOHN A. LOGAN, with the collaboration of Thomas H. G. Aitken, Guido V. Casini, Frederick W. Knipe, John Maier, and Athol J. Patterson. Baltimore: Johns Hopkins Press. 1953. Pp. 415.

Annotations

CHOLECYSTOGRAPHY AND CHOLANGIOGRAPHY

SINCE cholecystography was introduced by Graham and Cole in 1924, the radiographic examination of the gall-bladder with opaque media has been a routine and invaluable aid to the clinician in the diagnosis of gall-bladder disease. The contrast medium first used—tetrabromphenolphthalein—was soon replaced by the corresponding iodine derivative. Administration was at first intravenous, but later the oral route was adopted to avoid the systemic reactions which occasionally followed injection into a vein and the danger of sloughing of tissue from inadvertent local injection into the tissues. For some time there was doubt about the significance of failure to obtain any gall-bladder shadow. Experience, however, proved that the radiological finding of a "non-functioning gall-bladder" was fairly reliable evidence of disease; and Gordon[1] concludes that this finding is significant in about 94% of cases. Such a degree of reliability compares favourably with that of many other investigations which we regard as valuable.

In 1940 Dohrn and Diedrich[2] introduced an iodine-containing derivative of phenylpropionic acid which has been widely used (as pheniodol). It has the advantages that reactions to its oral administration are less common and absorption is more consistent. Moreover, since it is freely excreted also by the kidneys, it can be given without danger to patients with impaired liver function or even jaundice. Latterly it has been claimed that 'Telepaque,' a derivative of ethylpropanoic acid, causes even less alimentary upset and gives a denser shadow because its iodine content (66%) is 15% greater than that of pheniodol.[3]

The usefulness of these media depends on their concentration in the gall-bladder. They do not permit distinction between obstruction of the cystic duct and failure of concentration due to disease of the gall-bladder wall; and they do not display the bile-ducts except in the rare event of radiography coinciding with the secondary filling of the ducts with concentrated dye from the contracting gall-bladder. What is required is a substance that will display the biliary passages without concentration in the gall-bladder. This property is claimed for a new agent, 'Biligrafin Intravenous,' which is the disodium salt of adipic-di-(3-carboxy-2:4:6-triiodoanilide). It contains 64% of iodine, and after intravenous injection is excreted so rapidly into the bile-ducts that these are shown on radiographs taken 20–30 minutes after injection. The gall-bladder fills more slowly and is seen on films exposed about 2 hours after the injection. The practicability of cholangiography with biligrafin intravenous is confirmed by Hornykiewytsch and Stender,[4] Pahl,[5] and other German workers. It is said to be well tolerated when injected intravenously; accidental paravenous injection results in transient burning pain but no necrosis of tissue. The extrahepatic and even the intrahepatic ducts are nearly always shown, provided liver function is not seriously impaired and the sphincter of Oddi is competent; stones in the common duct are demonstrated even with jaundice of recent onset.

If these claims are confirmed, biligrafin intravenous should prove most valuable in the investigation of diseases of the biliary tract. It may prove particularly useful in the diagnosis of functional disturbances of the biliary tract both before and after cholecystectomy.

ANÆSTHETIC EXPLOSIONS

THE Ministry of Health's Working Party on Anæsthetic Explosions is expected to report soon on its investigations and to propose lines of research. Meanwhile Dr. Bullough describes on p. 798 of this issue a method of preventing the collection of explosive gases in the theatre by withdrawing them into the outer air. This method, which calls for a leakproof apparatus, does not reduce the risk of

1. Gordon, I. R. S. *Quart. J. Med.* 1953, **22**, 261.
2. Dohrn, M., Diedrich, P. *Dtsch. med. Wschr.* 1940, **66**, 1133.
3. See *Lancet*, 1953, i, 432.
4. Hornykiewytsch, T., Stender, H. St. *Fortschr. Röntgenstr.* 1953, **79**, 293.
5. Pahl, R. *Dtsch. med. Wschr.* 1954, **79**, 363.

explosion arising within the anæsthetic machine; but it will, as Dr. Bullough suggests, prevent explosions caused by ignition of a pool of gases outside the machine. A not inconsiderable advantage of Dr. Bullough's arrangement is greater purity of the theatre atmosphere. At the end of a long day anæsthetists, despite their acquired tolerance, are sometimes more noticeably sedated than at the outset.

In this week's issue of the *British Medical Journal*, Dr. J. G. Bourne draws attention to a danger of cyclopropane anæsthesia for dental extractions. A spark may be given off when forceps slip on a tooth; and Dr. Bourne finds that after administration of a mixture of 50% cyclopropane and 50% oxygen, the expired gases may be ignited by a spark up to the sixth exhalation after the anæsthetic is withdrawn. Cyclopropane, he says, should not at present be used for dental extractions.

CONTROL OF TRICHINOSIS

FROM time to time outbreaks of trichinosis in Britain draw renewed attention to the need for improved control of this serious and not infrequently fatal disease. Man is infected by eating trichinosed pork, while the pig is thought to become infected usually by eating scraps of raw pork. In other countries certain other mammals have recently been shown to spread the disease; in Germany fox trichinosis is apparently widespread, and cases in domestic pigs may largely arise from ingestion of infected fox flesh. During a series of outbreaks of trichinosis in Greenland in 1947, examination of muscles of the mammalian fauna showed that nearly 70% of the sledge dogs and about 30% of the Polar bears were infected.

One way of countering the risk of trichinosis in man is to examine samples of the muscle of all carcases of pork slaughtered for human consumption; and this method is followed routinely in Germany, Denmark, and other Continental countries. In British abattoirs no such routine examination is made; but isolated examinations from time to time have suggested that the prevalence of the disease in the pig population is low. In the U.S.A., on the other hand, trichinosis is a serious problem. Gould et al.[1] believe that, as a result of eating trichinosed pork, "about 25% of all Americans during their lifetime will harbour parasites in their muscles"; and 1·5% of the pigs slaughtered are infected with trichinosis. Only a small proportion of the pork is processed, under government regulations, by heating, freezing, or other methods.

Gould et al. have now described their investigations into gamma radiation of raw pork as a method of controlling the disease. They find that a dose of gamma radiation of Co^{60} applied to infected raw pork will render sterile any adult worms which may develop in man's intestine after a meal of such pork, while a slightly larger dose will render the encysted larvæ in the pork non-viable and prevent their development into adult forms. A preliminary study of irradiation with waste fission material contained in old nuclear fuel rods suggests that this may prove a suitable substitute for Co^{60}. It seems that the flavour of pork exposed to irradiation is unaffected, and no known harmful effect would ensue in a person who consumed it.

Further research on these lines will be followed with interest in this country, for the lack of data on the prevalence of the disease in our indigenous pig population must cause some concern. This gap should be filled by a country-wide survey. Another measure which would commend itself to public-health authorities is intensive propaganda drawing attention to the danger of pork products—particularly sausage—unless these are thoroughly cooked before they are consumed.

1. Gould, S. E., Gomberg, H. J., Bethell, F. H. *J. Amer. med. Ass.* 1954, **154**, 653.

PERIPHERAL ARTERIAL EMBOLISM

THE events that follow impaction of an embolus in a peripheral artery are fairly clear. The soft mass of blood-clot is subjected, after its initial arrest, to the hammer-like blows of the pulse wave, which may cause its disintegration and further migration. Where the embolus is finally impacted the artery may be moderately distended, with reactive œdema and cellular infiltration in its wall. Shepherd [1] has shown that occlusion of the femoral artery over a short segment caused a sharp fall of intraluminal pressure distal to the block, but that, owing to the collateral circulation, within a few minutes the peripheral blood-flow approximates to a normal resting level, although the amplitude of the pulse wave is impaired.

After embolic occlusion the expected restoration of blood-flow through collateral channels may not occur. The reason for this has been much debated; and Richards [2] has marshalled much of the evidence in a review of 52 closely studied patients. The patient with a severe cardiac lesion may not have a high enough blood-pressure effectively to open up collateral circulation. Moreover the embolus may lodge at a bifurcation, such as the division of the femoral artery, obstructing both the main vessel and the major collateral pathway. Some [3–5] believe that widespread arterial spasm, such as develops in traumatic lesions,[6] follows lodgment of an embolus. But many would agree with Pickering [7] that the idea of "vascular spasm, occurring in the absence of a recognisable stimulus is entertained too freely and uncritically in current thought and writing." The diminution in arterial diameter distal to the occlusion is probably quite often due to diminished arterial pressure; and Burton [8] suggests that blood-vessels, being distensible tubes, have a "critical closing pressure." Thrombosis probably always extends beyond the site of embolism.

Richards concludes that the clinical onset of embolic impaction is usually sudden and dramatic. Pain, if present, is of two types: an initial pain most severe at the onset and localised to the site of embolic occlusion; and a delayed ischæmic pain felt more peripherally, which becomes so intense that it dominates the clinical picture. Absence of peripheral pulses, changes in colour and temperature of the skin, and muscle and nerve lesions are evident on examination.

Enthusiasm for embolectomy has decreased in recent years.[9] Collective results published by Strömbeck [10] showed that two-thirds of patients so treated died in hospital, and only 19% were discharged with adequate circulation in the affected limb. The case for embolectomy is perhaps strongest where the embolus straddles the aortic bifurcation. Milwidsky et al.[11] state that most patients with an embolus at this point die from shock or heart-failure shortly after the onset of symptoms, and those who survive the first day usually die from limb gangrene and infection. Albright and Leonard [12] cited 26 reported cases in which an aortic saddle embolus had been successfully removed by embolectomy. Milwidsky et al.,[11] however, describe 2 cases in which the patients

1. Shepherd, J. T. *Clin. Sci.* 1950, **9**, 355.
2. Richards, R. L. *Quart. J. Med.* 1954, **23**, 73.
3. Reynolds, J. T., Jirka, F. J. *Surgery*, 1944, **16**, 485.
4. Holden, W. D. Acute Peripheral Arterial Occlusion. Springfield, Ill., 1952.
5. Nystrom, G. Lectures on Embolism and other Surgical Subjects. Baltimore, 1936.
6. Griffiths, D. L. *Brit. J. Surg.* 1940, **28**, 239.
7. Pickering, G. W. *Lancet*, 1951, ii, 845.
8. Burton, A. C. *In* Visceral Circulation. Edited by G. E. W. Wolstenholme. London, 1953.
9. See *Lancet*, 1953, ii, 1194.
10. Strömbeck, J. P. *Acta chir. scand.* 1935, **77**, 229.
11. Milwidsky, H., Ehrenfeld, E. N., de Vries, A. *Angiology*, 1952, **3**, 275.
12. Albright, H. L., Leonard, F. C. *New Engl. J. Med.* 1950, **242**, 271.

recovered with conservative therapy; and such experience is probably not exceptional. In the arteries of the arm and the smaller peripheral arteries of the leg embolectomy has no place. Richards [2] agrees with Veal and Dugan [13] that embolectomy is indicated when the embolus has lodged in the femoral arteries if conservative measures have not brought about distinct improvement within a few hours. Under conservative treatment morphine is given for the relief of pain, and the leg is kept horizontal in an environmental temperature of 20°–25°C. The body is warmed by a heat cradle or electric blanket, in an attempt to open up the peripheral circulation; and sympathetic constrictor fibres are interrupted by a paravertebral block of procaine hydrochloride or 8% phenol. Heparin should be given, to control secondary extension of the thrombus. There seems to be no advantage in intra-arterial injection of vasodilator drugs. Should both patient and limb survive—as in 24 of Richards's 52 cases—symptoms of arterial deficiency ensue. Claudication, nerve palsies, and nutritional changes are common, and few patients are symptom-free.

The correct treatment for peripheral embolism is still undecided. For a balanced evaluation it is important that further well-documented series like that of Richards—and not only reports of cases successfully treated—should be published.

OXFORD UNIVERSITY AND THE RADCLIFFE

THE future of the clinical medical school at Oxford is again under discussion. Ever since the establishment some twenty years ago of the Nuffield professorial units at the Radcliffe Infirmary, the practical service of a large county hospital has been supplemented by these specialised departments to which postgraduates from all over the world have come for training. These units have worked out their respective spheres of action more or less amicably with the established services, but a difficulty here as elsewhere has been the scarcity of beds. After the late war the Radcliffe Infirmary developed from a large county hospital to become the centre of the regional hospital organisation under the National Health Service.

In 1939 the teaching facilities in the Radcliffe were extended to allow for a complete medical course to be taken in Oxford, and in 1943 in the Goodenough report Oxford was envisaged as a small medical school of carefully selected students, taught under the tutorial system, the stress lying on the scientific aspects of medicine. On this suggestion medical opinion in the university is sharply divided: some feel that the preclinical and clinical departments could work closely together to this end, while others favour a wider training for a putative specialist, and doubt (as we do) whether he should be selected so early in his career. Certainly the clinical school will have to attract a number of candidates of a high intellectual calibre, which may not be easy for a young school competing with the prestige of the older hospitals in both medicine and sport.

Oxford University has now written to the Minister of Health asking for a controlling voice in the management of the Radcliffe Infirmary, so that it can develop as a teaching school on the lines of the Goodenough report, with the Nuffield professors of medicine, surgery, and obstetrics and gynæcology in full control of their departments, as regards finance, appointments, beds, and laboratory space. On this plan cases deemed unsuitable for teaching would presumably be admitted to such hospitals as the Churchill, a munificent present from the American Armed Forces to the City of Oxford. At present the allocation of cases between the two depends both on the facilities available and on their relative sites, the Churchill standing high above Oxford on the slopes of Shotover; and an artificial division of ill people into teaching or non-teaching cases would not be universally approved. The university says that its dissatisfaction with the present teaching arrangements was apparent to the hospital board when an application for the quinquennial grant was made in 1951 to the University Grants Committee; but the board state that they have never been informed exactly what changes the university desires in the teaching facilities, and express regret that they were not asked to comment on this letter to the Ministry until after the decision had been taken to send it. They are clearly anxious to fulfil their two great responsibilities in the Radcliffe Infirmary—to keep up its great tradition of service to the surrounding district, and to contain a thriving young medical school backed by the old-established preclinical departments. We should expect from Oxford a statesmanlike solution to this problem.

13. Veal, J. R., Dugan, T. J. *Ann. Surg.* 1951, **133**, 603.

EGGS AND RHEUMATIC FEVER

FEW would now dispute that infection with β-hæmolytic streptococci plays an important part in the ætiology of rheumatic fever; but the absence of these organisms from the rheumatic lesions themselves has led to the view that the true cause is some circulating toxic product of the organism; and since a first attack of rheumatic fever does not usually become manifest until 2–3 weeks after the streptococcal infection, the rheumatic lesions are usually regarded as the result, not of direct action of streptococcal toxin, but of an allergic reaction between the toxin and its specific antibody.

In epidemics of streptococcal sore throat, the incidence of rheumatic fever is usually about 3%.[1] Apart from some genetic predisposition little is known of the factors that lead to this complication. Nutrition has long been regarded as a possibly important factor, especially as the incidence of the disease is higher in the poorer members of the community. Coburn [2] showed that a supplement of egg-yolk powder equivalent to 8 eggs per day apparently had a significant protective effect in a small group of children known to be susceptible to rheumatic relapse after a streptococcal infection. Moreover, of 14 rheumatic children of wealthy families, only 1 ate a normal diet and 10 did not eat eggs at all. The mechanism of this protection was obscure, but Coburn was inclined to associate it with the rise in the serum-cholesterol level induced by eggs.

Wallis [3] has again drawn attention to the apparent protection afforded by this food. His evidence is based on the results of questioning 184 patients with rheumatic heart-disease and 1380 normal controls. Despite the undoubted errors that must mar such an investigation, the results are suggestive. 40·6% of all the cardiac patients asserted that they ate few eggs in childhood, and 10·2% expressed dislike for eggs; the comparable figures in the control group were 16·3% and 4·6%. In an attempt to explain this observation, Wallis and Viergiver [4] concentrate particularly on the level of the serum inhibitor of the serum extractable hæmolysin of β-hæmolytic streptococci—the so-called streptolysin S. It is now established that this naturally occurring inhibitor is, or is closely related to, plasma-phospholipid, and Wallis and Viergiver seek to correlate the protective value of eggs with their stimulating effect on plasma-phospholipid synthesis. They rightly point out that choline, an essential constituent of most of these phospholipids, is present in unusually rich amounts in egg-yolk; but they err in classing choline among the indispensable dietary constituents, since the body can readily synthesise all the choline it requires provided the intake of labile methyl

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2. Coburn, A. F., Moore, L. V. *Amer. J. Dis. Child.* 1943, **65**, 744.
3. Wallis, A. D. *Amer. J. med. Sci.* 1954, **227**, 167.
4. Wallis, A. D., Viergiver, E. *Ibid*, p. 171.

groups from other sources (e.g., methionine) is adequate. That choline is not deficient in rheumatic fever is confirmed by the absence of any signs of undue fat accumulation in the liver of patients with the disease. Furthermore, dietary deficiency of choline, while certainly affecting the phospholipid turnover in the liver, may nevertheless be associated with a rise in the plasma-phospholipids secondary to diminished intrahepatic utilisation.[5 6] Since, therefore, there is no real evidence that a diet deficient in eggs leads to deficiency of plasma-phospholipid, and hence of the serum inhibitor of streptolysin S, and since, moreover, there is no experimental evidence that this lysin produces any lesions resembling those of rheumatic fever,[7] the protection, if any, afforded by eggs cannot be explained on Wallis's hypothesis.

THE FEVER NURSE

THE General Nursing Council's proposal to ask the Minister of Health to close the infectious-diseases register has disquieted both doctors and matrons, who predicted that such a step would gravely damage the service.[8] The Minister of Health has now decided that the obligations of the council to maintain the register and to provide for admissions to it are to "remain in force for the time being."[9]

The G.N.C. suggested that training for the register was often unsatisfactory because of dearth of clinical material; and that, many of the training-schools being small, the services of sister-tutors were being used uneconomically. The council believed that the fever register might be discontinued without detriment, provided that suitable infectious-diseases hospitals were included in group schemes of training for the general part of the register. The Minister, though refusing to accept the council's proposal, is impressed by its reasoning. Training for the fever register, he says, should be concentrated in the larger units, and the smaller units should abandon the attempt to provide this training. Small hospitals are advised to take one or other of the following courses:

(*a*) To seek to become part of a group training-school training nurses for the general register.

(*b*) To seek approval as training-schools for assistant nurses in association with other suitable hospitals.

(*c*) To form their nursing establishment on the basis of a nucleus of registered fever nurses assisted by enrolled assistant nurses and/or nursing auxiliaries.

In the Minister's view the needs of the infectious-diseases hospitals for specially trained staff can best be met by general-trained nurses with additional training and experience. Such nurses can be admitted to the fever register after a year's post-registration training; but the G.N.C. has approved several experimental courses of training whereby general-trained nurses can qualify for admission to the fever register after nine months' additional training. The council is also ready to consider approving experimental courses of integrated training for admission to both the general and the infectious-diseases parts of the register.

The Ministry strongly advises the management committees of the hospitals which continue to train for the infectious-diseases register to try to attract general-trained nurses to take the special training; and to give such applicants preference over untrained applicants seeking to take the two-year course. It would be interesting to know, however, in what the attraction is to consist. The vulgar subject of money is not mentioned in this circular; but the fact remains that a general-trained nurse who seeks a further qualification in infectious diseases drops, on starting, some £15 per annum on the salary she has been getting as a staff nurse in a general hospital—a somewhat negative attraction.

HÆMOLYSIS AND ECLAMPSIA

Pritchard et al.[1] have described three cases of eclampsia complicated by severe intravascular hæmolysis, thrombocytopenia, and deficiency of some clotting factor which was present in fresh normal plasma. Plasma-fibrinogen levels were normal; the patients' blood contained no auto-agglutinins or hæmolysins, and in only one case was there rhesus incompatibility with positive direct and indirect Coombs tests. Corticotrophin (A.C.T.H.) was given to each of these patients, and in two, who died, the platelet-counts increased; but in the third, who survived, the platelets increased spontaneously, and Pritchard et al. believe that corticotrophin did not influence the course of the disease.

Although pigment casts are found in the collecting tubules of the kidney in fatal eclampsia,[2] such gross hæmolytic episodes as those described by Pritchard et al. are uncommon. Young and McMichael[3] described the "crush syndrome" in two women who had difficult labours; and Young[4] reported several such cases, from which he concluded that this syndrome arose in obstetrics only with trauma to the maternal tissues or premature separation of the placenta. Paxson et al.[5] reported a case of eclampsia with clinical and pathological features of this type.

Clotting defects due to fibrinogenopenia, and histological changes superficially similar to those of toxæmia of pregnancy, have been induced in animals by injections of thromboplastin[6] and trauma to the placenta[7]; and fibrinogenopenia has been demonstrated in patients with eclampsia and retroplacental hæmatomas,[8] in whom incidentally the plasma showed traces of hæmolysis. Although fibrinogenopenia was not a feature in Pritchard's cases a derangement of normal hæmostasis, which was not fully understood, was detected in both series, and a common ætiology may reasonably be suspected. Pritchard and his colleagues conclude that some immunological reaction was responsible for the condition they describe; and, if it cannot be explained in terms of the crush syndrome, at least the trend of their thought is shared by another group, who have likened the manifestations of eclampsia to a generalised Shwartzman phenomenon.[9]

Dr. J. GREENWOOD WILSON has been appointed medical officer of health of the Port of London.

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Special Articles

THE MENTAL HEALTH OF UNDERGRADUATES IN ENGLAND

A report on the first 18 months of a psychiatric service for students at the London School of Economics.

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IN the major American universities the mental health of the students has for some years had systematic attention. The fullest reports have come from Yale and Michigan. In 1942 Fry and Rostow [2] gave a very readable account of a decade's experience at Yale, and Raphael [9–13] has provided data of all kinds on the mental health of the students at Michigan University since the opening of a full-time service in 1930. Other valuable papers have come from Harvard,[18] Minnesota,[4] Oakland,[14] and some of the medical schools.[5 15 16 20] But in this country little information has been available. Parnell in 1947 drew attention to his finding at routine examinations that minor psychological disturbances are common [7]; but more interest was generally taken in his indictment in 1951 of mental illness as the most important cause of a loss of a term or more of residence at Oxford.[8] A similar finding in a report for 1949–50 made to the University of Wales was noted by the *British Medical Journal*,[1] and *The Lancet* [6] drew attention to Macklin's two-year study at Aberdeen which pointed out the bad effect of an overfilled curriculum. Other annotations in 1951 in both these journals refer to the unusual strains of undergraduate life and their effect on mental health. In the same year Verney [19] commented on the influence of National Service on Edinburgh medical students, and Swainson [17] described a project carried out by a lay therapist at University College, Leicester. But very little on the subject has appeared since then.

At the third Conference on Student Health in British Universities and Medical Schools, held under the auspices of the Nuffield Provincial Hospitals Trust at Cambridge in 1951, mental health was a good deal discussed. Of the many papers presented at that gathering the only one published is that of Henn,[3] dealing with failure in examinations; but the privately circulated transcripts contained much interesting material and showed that at various universities special provision had been made for students needing psychiatric help. In London, however, little had been done except at University College, where psychiatric advice was provided by the student health centre.

AN EXPERIMENTAL SERVICE

In January, 1952, on the initiative of the Institute of Psychiatry, an experimental psychiatric service was established for students of the London School of Economics.

At this school there is no routine medical examination of new students, and it was thought inexpedient to try to discover the prevalence of nervous troubles by circulating questionnaires. To find out who would come for psychiatric advice, and for what kind of problem, a purely clinical approach seemed to be the right one. The only publicity given to the service, to launch it, was a meeting between the students' welfare committee and the psychiatrist, and a letter sent individually to the students inviting them to come for consultation if they were worried about their work or their personal life. The confidential nature of the service was emphasised, and the fact that no fees would be payable. The staff, also, were informed by letter of the purpose of the service. The plan was to interview all who sought advice, and, after making sure they were not already in a doctor's hands, to take as complete a history as possible and, where it seemed proper, undertake treatment. It was arranged that in cases of serious breakdown the patient could be referred to the Maudsley Hospital. Six sessions weekly were held at the school, but those who preferred greater privacy could be seen at other times at the Institute of Psychiatry.

During the remainder of the 1951–52 session, 68 students came for advice and treatment. In the 1952–53 session, 63 new cases presented themselves. Thus the total for the whole period from Jan. 24, 1952, to June 30, 1953, was 131. Of these, in the first session 64 were full-time students (out of a total of 1743), and 4 were part-time students (out of a total of 402). In the second session 59 were full-time students (out of a total of 1753), and 4 part-time (out of a total of 434). 20 students first seen in 1951–52 were carried into 1952–53 which made the total dealt with in this session 83.

Because so many attended, patients were rarely seen more frequently than once a week. The usual length of an interview was fifty minutes, but the first usually lasted an hour. The number of times any one student was seen varied between 1 and 53, the average being 9. Ages ranged between 18 and 40 years (average 24½).

DIAGNOSES

The diagnoses were:

1. SEVERE CASES

Affective breakdown	3
Mixed depression and anxiety	3
Acute anxiety attacks	3
Chronic anxiety state	3
Anxiety with disorder of physical function	2
Mixed anxiety and obsessional state	1
Obsessional state	3
Hypochondriasis	1
Conversion hysteria	1
Personality disturbances with marked social consequences	7
	27

2. MODERATE CASES

Depression	2
Anxiety state	3
Anxiety with disorder of physical function	6
Emotional outbursts	2
Hypochondriasis	2
Asthma and dermatitis	1
Paranoid state	2
Obsessional state	3
Speech difficulties	2
Personality disturbances (inferiority feelings, study difficulties, &c.)	12
Marital and other family problems	4
Psychosexual difficulties	5
	44

3. MILD CASES

Depression	4
Anxiety state	8
Emotional outbursts	3
Obsessional state	2
Hypochondriasis	2
Physical symptoms of functional origin	5
Personality disturbances (inferiority feelings, study difficulties, &c.)	17
Marital and family problems	7
Psychosexual difficulties	9
Other problems	3
	60

The allocation of these cases to one of the three categories of severity is necessarily imprecise. It depends either on the acuteness of the disturbance at first presentation or the degree to which the patient's nervous condition affected his social adjustment.

As examples of those put into the first group may be cited students with affective disorders who needed hospital care, those suffering from acute anxiety attacks so severe that they were physically ill, and those whose symptoms were so severe that it was obvious to their

teachers that they needed treatment and perhaps advice whether or not to continue with their studies. 11 of the patients allotted to this group had had psychiatric advice on some previous occasion and 5 of them had had frank breakdowns.

The patients placed in the second category are those whose symptoms were evidence of a considerable degree of disturbance but whose social adjustment was good enough for their distress to have remained to a large extent a private matter. In this group perhaps the clearest signs of improvement due to treatment are shown.

The third group is similar to the second but milder.

RESULTS

The table shows the result of treatment in those who came for more than one interview.

RESULTS OF TREATMENT

Category	Case complete or student left L.S.E.	Still having treatment
Severe :		
Much improved	4	1
Some improvement	7	8
No change	1	2
Moderate :		
Much improved	5	2
Some improvement	10	8
No change	11	7
Mild :		
Much improved	16	—
Some improvement	12	1
No change	8	2
Total :		
Much improved	25	3
Some improvement	29	17
No change	20	11

11 students terminated their treatment by default.

In 53 cases the emotional disturbance was affecting the student's studies in an obvious manner; in 15 of these treatment led to a definite improvement in this respect.

The therapeutic effects of the clinic are difficult to assess with any accuracy. So much else goes on in the lives of students, and so many of them are at a period of great change in their personal development, that such evaluations are even more hazardous than with the average series of results of psychotherapy. It can, however, be said that their symptoms improve and that the students connect this with their interviews and themselves suggest discontinuing as soon as they feel fit to do so.

The diagnoses of the 12 cases in the first two groups which showed a marked improvement are :

Acute anxiety attacks	3
Anxiety state	1
Anxiety with disorder of physical function	2
Obsessional state	2
Hypochondriasis	1
Personality disturbance affecting relations with others	2
Personality disturbance mainly revealed in study difficulty	1

To achieve this improvement the various types of anxiety required between 5 and 37 interviews; obsessional states 13 and 20; the case of hypochondriasis 30, and the personality disturbances 15, 23, and 41.

An effort was made to make the clinic self-contained and not to regard it as a stepping-stone on the way to treatment elsewhere, except for the few patients who were ill enough to need hospital care. Treatment at weekly intervals is not intensive, but patients of this age and intelligence seem definitely able to benefit from it. It is an advantage that the small amount of time required interferes little with other commitments, an important consideration in view of the fullness of the present-day undergraduate time-table.

That the students in the first two groups can be successfully dealt with in such circumstances goes far to justify such a clinic as this; and there is reason to believe that some of them might have hesitated dangerously to seek help if it had been more difficult to obtain. All those in the third group, whose condition might be described as a neurotic reaction to a situation of temporary strain, would hardly be accepted for treatment elsewhere and yet undoubtedly need help. The undergraduate is living under conditions of special strain—intellectual, financial, and cultural. The healthy student will withstand this strain and may even benefit from it, but the more vulnerable individual gives way and begins to exhibit weaknesses and abnormalities which in less exacting circumstances would have remained latent. Such in varying degree is the situation of the students whose cases are enumerated above.

These emotional disturbances, unless severe, may pass unrecognised. This is illustrated to some extent by the fact that only 27 of the 131 students came for advice at the suggestion of their teachers; in the remainder there were only 20 of whom it could be gathered from the school records that they were in any way unstable. A psychiatric service of this kind permits the quickest contact and disposal for the severe cases, and the others have assistance which they would not find easy to obtain elsewhere.

CONCLUSION

From this eighteen months' experience it is clear that a service of this kind at a school or university has great advantages: teachers and administrators find it helpful to have a close contact with a psychiatrist in the case of need; and there is no doubt that students are prepared to seek advice when they feel themselves to be emotionally disturbed. None come frivolously and few show any inclination to prolong their attendance unduly: they have too much else to do. As they have the insight to seek help and the ability to use if when it is provided, a psychiatric service for students appears to meet a real need and deserves to become an integral part of a university school. It is justified by the immediate gain for certain students and the probable good effect on their future well-being; and over a number of years such a service would be a valuable source of information about the mental health of the community, because of the high intelligence and ability to communicate of its patients, who are drawn from a very wide range of the population.

Thanks are due first and foremost to Prof. Aubrey Lewis, of the Institute of Psychiatry, who conceived the idea of this service, gave it the opportunity to develop, and has supported it throughout with his advice and kindness; to the Board of Governors of Bethlem Royal Hospital and the Maudsley Hospital for financial support; and also to Sir Alexander Carr-Saunders, and the staff and students of the London School of Economics, for their hospitality to the experiment and their coöperation in running it.

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THE DISTRESSED STUDENT

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THE occupational hazards of a student are principally psychiatric. In its most specialised aspect, the work of a doctor in charge of a student health service concerns mental distress. Recently in this country there has been a considerable amount of publicity about mental ill health in the universities, and in particular about its tragic highlight—suicide. A general discussion of the topic may, therefore, be in order.

THE SIZE OF THE PROBLEM

How prevalent is student distress? What, in the unsatisfactory analogy of disease, is the morbidity-rate? It is almost impossible to answer this; for, except by an objective and dramatic action, like abandoning an examination, assaulting a professor, or committing suicide, the student only registers his distress if he comes and tells you. By no means all distressed people tell their troubles to others. Even when they do, it may not be to the university physician, but to a friend, or an academic supervisor, or even a doctor outside. Their unhappiness is then statistically non-existent. Again, the degree of distress which a person will suffer before coming to the consulting-room varies greatly. In America, where psychiatry is respectable almost to the point of being de rigueur, the number of people going to psychiatrists is higher than in this country, but one would hesitate to conclude that the sufferings are greater. At Oxford Parnell[1] was able to trace 9 suicides among 18,500 student years, whereas at University College, London, I am able to find only 2 suicides in 12,000 student years. Even as a Cambridge man, I find it hard to believe that the differences are due to the more heinous conditions at Oxford. They must reflect differences in the students' cultural backgrounds. Despite the difficulties, one must try to compose some sort of estimates.

At University College, London, there are about 2800 full-time students and about 600 part-time. Only a small proportion of the part-timers are likely to use the health service, so it might be fair to say the population at risk is about 3000. About 75 new cases of distress present themselves every year. Assuming an average stay at college of three years, there would be 225 students who had suffered, were suffering, or were going to suffer distress that would bring them to the consulting-rooms. This would represent something like $7\frac{1}{2}$% of the total population. About half the students come from homes in the London area and live at home during their course; about half of these apparently do not use the health service. It seems probable that if, and when, they suffer distress and seek help, they go to their family doctor, or perhaps their priest, rather than come to us. If these few are included in our estimate, the prevalence goes up to 10%.

It is difficult to compare this estimate with the incidence of distress in other institutions because circumstances are always different. In the University of Michigan, which has a well-developed mental-hygiene service, 10% of the student body—the same proportion—had sought help at one time or another during their course. Most other American mental-health services have a similar attendance. In England comparisons are more difficult, but most of my colleagues would accept this general estimate. The round figure of 10%, then, is probably as close as one can get. It is a considerable figure and in practice must have considerable implications.

In this country, about 10% of the students who start at university do not finish the course. Most of these failures occur at the end of the first or second year. a small number repeatedly fail their final examinations. Since everyone who comes to university has presumably shown adequate intellectual ability in the entrance examinations, it seems more than probable that distress, as one meets it clinically, is a major element in this failure.

THE QUALITY OF THE PROBLEM

Psychiatric classification is an inaccurate necessity. The following has a rough utility:

Serious mental illness.—In this group are the psychoses (of which schizophrenia is far and away the most common), the melancholias, the confusional states, and those psychoneurotic disturbances that are so severe as to constitute an almost total disability. At University College over the last four years about 5% of distressed students fall into this category. In general this tallies with figures from many American universities and is similar to figures from other English universities.

Severe adjustment problems.—This empirical category covers those cases where distress is a major obstacle to the student's university career or personal happiness. Dealing with his distress is, therefore, his primary concern, for it compromises the possibilities of university success. Most of the students in this category have a definitely psychoneurotic personality and my clinical impression is that they will suffer psychiatric symptoms off and on throughout their life. At University College, about 30% of the distressed students can be classified here.

Mild adjustment problems.—In this equally empirical category are all those students who suffer distress which is a disability to them, yet not one of overriding severity. Such people may be successful in the university, both in their examinations and in their social life. Nevertheless, they are suffering unhappiness, and usually some diminished efficiency, and they come to the consulting-room in the hope of amelioration. At University College about half of the distressed students belong to this group.

Miscellaneous.—One is left, as always, with a mixed bag of cases—i.e., those referred by the departments for administrative reasons, and so forth.

HOW THE DOCTOR CAN HELP

For the university physician, the severe cases, paradoxically enough, are fairly easy to manage. Treatment is primarily for the qualified psychiatrist and it almost always involves interruption of studies and admission to hospital. It is the adjustment problems, serious or mild, that are the headache of university practice. Not only are they numerically the greatest, but their management, as a rule, falls to the physician himself.

The first step is to take a full *history*. This must cover not only such obvious things as the family relationships, social life, sexual life, and previous periods of unhappiness, but it must also go thoroughly into the student's academic record, his way of work, his hours of work, and all his particular studying difficulties. If there is any question in the patient's mind as to whether there could be any physical basis to his symptoms, a full medical examination must be undertaken. In my view, this full know-

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ledge of the patient, and the personal rapport that is made in getting it, is the basis of effective help.

The simplest help one can give is by medication. A little judicious sedation with the ordinary barbiturates is a relief to most unhappy people. Sometimes a stimulant is more effective. Occasionally something a little more bizarre is indicated. Doubtless the psychological effect of bottles and pills is often as important as the pharmacological—no matter, it helps. All clinical work is empirical.

Advice is next in the clinical armamentarium. Simple study advice is often needed. Many students, particularly anxious students, overwork themselves greatly. They study till late at night, and when exhaustion impairs their efficiency they are overcome by mortifications and anxiety. If one can impress them sufficiently with one's own confidence, they may be prevailed upon to work more regular hours and stop before the point of tiredness. They may be persuaded to take up games or other social activities which, in their anxiety, they have cut out of their life to make way for work. They have not realised that the mind does not rest; it is refreshed only by variety. Simple physiological advice, even with reference to Kinsey, may be valuable. It is surprising how many young men in this enlightened age have not realised that masturbation, or even simple nocturnal emission, is an ordinary event, and not a hideous perversion. Sometimes a little straight advice about a love affair that has gone on too long works wonders. Sometimes financial problems have to be discussed so that a bursary can be arranged. Sometimes loneliness or homesickness can be countered by getting an all too scarce place in a university hostel. All these things, many of them in essence hardly medical at all, have a prominent place in the treatment of student distress, particularly in the treatment of the milder adjustment problems.

Support, by which I mean simply keeping in touch, seeing the patient again in a week or a fortnight, is also an essential part of treatment. It may not always be necessary to fix appointments in advance, but it is essential to impress upon the student that he has immediate and easy access to you and that you are pleased to see him and not bothered by him. Not to have to carry one's problem quite alone lightens it a lot, and many a student will be helped by being able to see one repeatedly, even, as it were, only to gossip.

There is no doubt in my mind that a fair proportion of students with severe adjustment problems cannot be helped without formal *psychotherapy*. Any university doctor is bound either to undertake some such treatment himself, or to refer cases for treatment elsewhere. Only a minority of distressed students need psychotherapy, but for them it is irreplaceable.

For a student to begin a course of psychotherapy, particularly a course of psycho-analysis, brings its own problems. Not only is it time-consuming, but it takes a great deal of mental energy. Its immediate aim is not to establish a day-to-day working compromise, but to bring to the surface difficult emotional problems, forcing them into prominence so that they can be grasped and dealt with, however painfully. Often the student, held into the tramlines of an academic course requiring regular and repeated effort, finds it difficult to manage the two things at once. In general the simpler procedures of medication, advice, and support, all that is sometimes called "counselling," are the most appropriate to treating distress among students. Supportive therapy, which cannot be continued indefinitely, has been criticised as a transient and palliative procedure whose benefits will fade once the patient is discharged. But the circumstances and difficulties of the student are themselves transient, and in this work supportive therapy has a place of election.

CAUSES OF DISTRESS

Most of us, having in mind some vague image of summer punting on the backs, think of a university as inherently pleasant. When we realise that many young people are far from happy there, we instinctively feel that there must be something, or some combination of things, superimposed to prevent its natural joy.

Many factors have been invoked as such malign influences. The syllabus is overloaded. Games and recreational facilities are inadequate. There is a dreadful lack of hostels and halls of residence. Social contact between students and dons is less than it used to be. Interest in religion is waning. The grants system sometimes brings up students unsuited for the university as it is, particularly when there are great discrepancies between the cultural backgrounds of home and college. All these things are important and all take their toll. But there is more to it than that. Difficulties, of one sort and another, are the common stock of life, but they do not usually make such havoc of happiness and achievement. More and more I come to feel that for many people there must be some element of severe emotional strain implicit in the process of higher education itself.

But why should university life be difficult? I should say that learning—taking in—absorbing—is essentially a faculty of the young, of the prepubertal. On reaching physical maturity, an animal—or man in the more natural state—becomes independent, fends for himself, takes a mate, produces offspring, initiates rather than copies, acts rather than learns. His modus operandi becomes out-going rather than in-taking. In society, however, we block the simple course of Nature. The physically mature is still socially immature. By enjoining a further long period of education, we impose a period of psychological childhood on the physiological adult. For however courteous and sophisticated a university may be, being an undergraduate involves, in essence, a childhood situation. It means a greater or less period of celibacy; a greater or less period of dependence, either on the parents or on a benign parental government; and essentially a period of intensive learning—of in-taking rather than out-putting. It is this discordance, inevitable in a modern society, which I suggest is the implicit difficulty of the student. Many can cope with it and come through their university career with happiness and vigour. Many, even sturdy people, patently cannot.

It may be, then, that the present casualty-list, great as it seems, is nearly as low as we can get it under the present conditions. Any radical improvement might involve really radical changes in the form of higher education. Good universities are soaked in tradition, as good Stiltons are soaked in port; they might find it hard.

Even assuming a preparedness for radical change, it is hard to know what could be done. The fact is nobody now knows where, how, or why the student comes unstuck. The university after all is a productive machine. Time and again we have scrutinised the raw material. Volumes have been written on student selection and thousands of pounds have been spent on selection research. Time and again we have scrutinised the finished product. Industry, the Civil Service, and the Armed Forces—all have advised us about the material they want, and what they in fact receive. Now we are beginning to scrutinise the rejects, the mental breakdowns, and the failures. I fancy the next step should be to scrutinise the machine. It is not sacrosanct, it was made by man, not sent by God. A very small part of the cost of the failures would support a full-scale study of the university, its students, and their mutual impact. Then, but surely only then, we could all make some really sensible suggestions.

DOUBLY HANDICAPPED CHILDREN

RAYNERS SCHOOL, PENN

ANY deaf child, if he is to learn to communicate with his world, needs his wits about him. But when his wits, like his hearing, are defective, then he is handicapped indeed: in a losing race, he falls steadily farther and farther behind his age-group. Yet his mental defect may not be great: he may well be merely feeble-minded; or a high-grade imbecile, able to respond well to appropriate education. Rayners School, at Penn, in Buckinghamshire, caters for just such children, as well as for others who are deaf and mentally normal but handicapped in other ways.

FULL HOUSE

This boarding-school, now belonging to the London County Council, was first opened by the London School Board in 1900, in Hackney; and for many years it was unique in providing education, training, and care of deaf or partially deaf children with additional handicaps. The school was moved from London to the comfortable Victorian house, "Rayners," in 1921. Here it is set in beautiful surroundings, in an old and famous village, with twenty-three acres of gardens and playing-fields about it. With 62 children in residence it is full—even too full. The big, pleasantly coloured bedrooms which have become dormitories contain rather too many beds, the dining-tables are rather too crowded, the classrooms have had to be subdivided, the rooms are not quite light enough, and there is no school hall. The reason for this elbow-jostling is that Rayners—which takes children not only from London (though these have preference) but from all parts of the country—has a waiting-list longer than its roll-call. And so far there have never been any serious epidemics. All the same the work of the school would probably benefit, and the roll could certainly be increased if two or three modern classrooms rose up on the foundations of the old stables, lying near the house.

WORD AND SIGN

Meanwhile, it is a lively and cheerful place, and doing remarkably good work.

Of the 62 boys and girls between the ages of 5 and 16 now in residence, 34 are deaf and educationally subnormal, 17 are partially deaf and educationally subnormal, 2 are deaf and partially sighted, 2 are partially deaf and partially sighted; and 7 have three handicaps apiece, 3 being deaf, educationally subnormal, and physically handicapped, 3 deaf, educationally subnormal, and partially sighted, and 1 partially deaf, educationally subnormal, and physically handicapped.

The fact that some have residual hearing raises an educational problem, as Mr. John H. Blount, the headmaster, has explained elsewhere.[1] For those who can hear a little, the oral system of training—speech and lip-reading—is the method of choice; but when a child is both deaf and dull the great need is to get into touch with him—to establish some precise means of communication—so that his understimulated mind has a chance to respond and develop. In teaching such children Mr. Blount has no hesitation in using finger-spelling. The difficulty comes, as he says, from having children of both types working side by side. It would be better to have them in separate schools; but he does the best he can by keeping them as far as possible in different classes. All the partially deaf children have hearing-aids, and every effort is made to get them to learn to lip-read and to speak. The generous staffing of the school—there are only about 8 children in each class—makes much individual teaching possible. However, when a deaf child finds it impossible to comprehend language (and lip-reading must follow and depend on the comprehension of language), he is taught finger-spelling. A remarkable development in his educability often follows.

It is generally held that once a child has been allowed to learn finger-spelling he will never take the trouble to learn to speak; and this is probably the case with most mentally normal children. Mr. Blount, however, does not join in the general condemnation of finger-spelling. His own parents, intelligent people, were both deaf, and had both learnt to lip-read and speak; nevertheless, they agreed that in talking to other deaf people finger-spelling was often useful, because it was precise: if they wished to make absolutely sure that a message was understood they used finger-spelling. This is a practical point which deserves reasonable attention.

Mr. Blount would like to be able to segregate not only the deaf from those with partial hearing but also the educationally normal from the educationally subnormal children; for, as he says, if it is thought undesirable to mix these two groups among children who can hear, how much less desirable it is to mix them when the children are handicapped by deafness. He estimates that there are, in England and Wales, about 240 children who need special education as deaf—or partially deaf—with additional handicaps. We need, he thinks, four schools: one, taking about 100 children, for the deaf and educationally subnormal; another for about 60 partially deaf and educationally subnormal children; and two others, each taking about 40—one for mentally normal deaf children with some other handicap, the other for mentally normal partially deaf children with some other handicap. A thorough examination of children in ordinary schools for the deaf would, he believes, bring to light quite 100 educationally subnormal children who had failed to profit by the oral method; and these could be taught far more adequately in a separate school by finger-spelling.

SOME RESULTS

The children in the classrooms at Rayners are certainly alert and responsive, for the most part, especially to finger-spelling. The seniors, even if they do not choose to speak much, are not bad at lip-reading; and the standard of school work (as judged by exercise books) is remarkably high: the best group of children—at present chiefly boys approaching leaving age—can read, write a neat hand, compose a good informative letter, and do quite advanced sums. They are also well-mannered, cheerful, attentive and friendly. In recreation time they play football or cricket on their own playing-fields, help the gardeners, or otherwise enjoy themselves in the grounds and countryside. Those who are normal mentally—and even some who are not—can hope to earn their own living: aftercare records show that 61% find satisfactory employment and become self-supporting, and a further 14%, though not entirely self-supporting, are also in satisfactory employment; 14% prove to be unemployable, and end up in institutions, and 11% have either died or cannot be traced. This seems a record of useful work.

1. *Special Schools Journal*, 1953, **42**, 8.

Medicine and the Law

Spinal Anæsthesia

A JUDGMENT [1] in the Court of Appeal has upheld the decision [2] of Mr. Justice McNair in an action alleging negligence in the administration of spinal anæsthetics. Both plaintiffs had had intrathecal injections of 'Nupercaine' in the same hospital on the same day in 1947, and both had later become paralysed. The judge found that the damage was caused by contamination by the phenol in which the apparently intact ampoules were stored, and he held that the anæsthetist was not negligent in failing to appreciate this risk in 1947. Their Lordships in the Court of Appeal agreed; and Lord Justice Denning added: "We must not condemn as negligence that which is only a misadventure."

1. *Times*, April 9, 1954.
2. See *Lancet*, 1953, ii, 1089.

Reconstruction

THE AUSTRALIAN HEALTH SERVICE

UNLIKE our own health service, which began on the appointed day "all at once and nothing first," the Australian health service is being introduced in two parts and by easy stages. Long-term plans for capital expenditure on universities, medical schools, and hospitals will form the second part. The first part tackles the prevention and treatment of disease by the provision of free drugs, tuberculosis allowances, and medical and hospital benefits. A basic principle of the scheme is that eligibility for a large part of the benefits depends on voluntary insurance rather than compulsory contributions. The introduction last July of the scheme for medical benefits completed the first part, and offers a convenient opportunity to review the whole scheme.

The first moves were exercises in preventive medicine.

ANTI-TUBERCULOSIS CAMPAIGN

In July, 1950, generous tuberculosis allowances were introduced to ensure that people who were infected would not hesitate to accept treatment. Over 6000 new cases have been discovered since the allowances were introduced. The weekly allowances are:

	£	s.	d.
Patient with dependant wife	9	0	0
Each dependant child		10	0
Patient without dependants receiving inpatient treatment free of charge	3	7	6
Patient without dependants not receiving free inpatient treatment	5	10	0

These allowances are subject to a means test which has regard to income but not to property. Thus a patient may have an income of up to £2 (£4 for a married couple) a week without affecting his allowance. Patients who receive these allowances must give up work temporarily and accept treatment and examination in an institution or at home according to medical advice.

The Commonwealth has also entered into an agreement with each State to carry out an anti-tuberculosis campaign. The Commonwealth has agreed to reimburse the States for all approved capital expenditure incurred after July 1, 1948, and all maintenance expenditure above the 1947–48 figure. As part of this national campaign each State has made compulsory the notification of all cases of tuberculosis. Everyone over the age of 14 must have his lungs radiographed. Anyone with tuberculosis and all contacts must accept any medical, X-ray, or bacteriological examination thought necessary. The States have also taken power to restrain recalcitrant patients (such as the tuberculous patient who is a chronic alcoholic) who are a menace to themselves and to the community.

FREE MILK

Another preventive measure introduced in 1950 was the provision of free milk for children. The Commonwealth now provides one-third of a pint of milk free on each school day in the year for 750,000 children under 13. All the States are taking part in this service.

PHARMACEUTICAL BENEFIT

In September, 1950, a limited number of "life-saving and disease-preventing drugs" were made available free of charge to everyone on a doctor's prescription. In the first three years 20 million prescriptions have been made up. At first the list, on which there were no compounds, contained 139 items, and by March, 1951, there were 185 items. The cost of the scheme for the first full year, 1951–52, was about £7½ million. Owing to excessive prescribing of some scarce and expensive drugs, notably the antibiotics, a measure of control has been introduced.[1]

1. Dampney, M. J. *Lancet*, 1952, ii, 879.

By 1951 a doctor before prescribing streptomycin or chloramphenicol had to obtain a numbered authority from his State director-general of health. The minister of health may declare by regulation that a drug may only be prescribed in the treatment of a disease specified by him.

The list of drugs was prepared by an expert committee which from time to time advises the minister on the inclusion or exclusion of drugs. A research organisation has been set up in the pharmaceutical departments of the Universities of Sydney and Melbourne to test the purity and standard of the drugs supplied.

MEDICAL SERVICE FOR PENSIONERS

Early in 1951 a free family-doctor service, including free drugs, was made available for pensioners and their dependants. This includes everyone who gets an age, invalid, widow's, or Service pension (but not a war pension), or a tuberculosis allowance. The service does not include specialist treatment.

The doctor may make a small charge (not exceeding 5*s*.) for treatment outside the ordinary hours of his practice. The pensioner and his dependants are entitled, free of charge, not only to approved life-saving and disease-preventing drugs but also to almost all the drugs and preparations in the *British Pharmacopœia* and any combinations of these, but not to proprietary preparations and medicinal or industrial gases.

The scope of medical services and the terms, conditions, and fee schedules of the doctors who provide them have been agreed by the minister of health and the Federal council of the British Medical Association.

HOSPITAL BENEFITS

These were introduced at the beginning of 1951 and are the first section of the scheme to be bound up with voluntary insurance.

There are two forms of hospital benefit. The first, usually called the "ordinary benefit," of 8*s*. a day, is paid by the Commonwealth to any approved hospital, public or private, in respect of each inpatient, whether or not he is a member of an insurance organisation.

An additional benefit of 4*s*. a day, called the Commonwealth benefit, is available only to members (or dependants of members) of a registered hospital insurance organisation. It is also available to pensioners.

Most organisations have waiting periods and do not pay benefit for diseases existing when the member joins. But a member, even when he is not eligible for benefit from his own organisation, can claim the Commonwealth benefit.

It is a condition of registration of the hospital insurance organisation that it should be prepared to pay a benefit of at least 6*s*. a day. A member of a registered organisation can thus count on a hospital benefit of at least 18*s*. a day (8*s*. ordinary benefit, 4*s*. Commonwealth benefit, 6*s*. private insurance benefit). These benefits are intended to cover only hospital board and nursing care. The cost of medical care is covered by the scheme of medical benefits.

The time of stay in hospital covered for benefit is at least 10 weeks for general treatment, and up to 15 days for maternity care. Doctors may recommend extensions.

MEDICAL BENEFITS

These latest benefits, which began in July of this year, are available only to members (or dependants of members) of an approved medical insurance organisation. But here again members are eligible for a government benefit even when they are not eligible for benefits from their private organisation—e.g., during a waiting period before qualifying for benefit and for chronic or pre-existing illness.

The medical benefit, which is paid directly to the insurance organisation, takes the form of a subsidy towards the cost of treatment. The government's aim is that their subsidy, plus the payment from the patient's own insurance organisation, should "cover the major portion of the doctor's bill."

The government subsidy varies according to the nature of the service. It remains the same whatever fee the doctor charges and whether the service is rendered by general practitioner or consultant. The government have compiled a table of their subsidies which has been divided into two schedules. The first (or minimum) schedule covers consultations and visits and the common medical, surgical, and obstetrical service; the second (or optional) schedule covers specialised services such as radiological, laboratory, and the less common medical and surgical services. An insurance organisation will not be approved by the government unless it provides benefits, at least equal to the government's subsidy, for all the services included in the minimum schedule. The following are examples of the subsidies offered:

Type of service	*Commonwealth benefit* £ s. d.	*Commonwealth plus minimum private benefit* £ s. d.
Professional attendance, non-specialist (at rooms, surgery, or hospital) ..	6 0	12 0
Specialist attendance:		
(a) Referred by another doctor—first attendance	1 0 0	2 0 0
(b) Referred by another doctor—subsequent attendance	10 0	1 0 0
(c) Not referred by another doctor	6 0	12 0
Appendicectomy	5 12 6	11 5 0
Exploratory laparotomy	5 12 6	11 5 0
Cholecystectomy	11 5 0	22 10 0
Antenatal care—seven or less attendances (each)	6 0	12 0
More than seven attendances.. ..	2 2 0	4 4 0
Confinement and postnatal care ..	2 5 0	4 10 0
Antenatal, confinement, postnatal ..	3 15 0	7 10 0

An insurance organisation need not pay benefits for the services in the optional schedule, but its members are still entitled to claim the government subsidy. The government hope that with the backing of the new scheme the insurance organisations will extend their benefits, and members their insurance, to cover the optional schedule. The combined government and private benefits should, they believe, then "largely meet the cost of specialist services."

The government believe that most people who are barred by age and illness from joining a voluntary insurance society will probably be receiving an age, invalid, or widow's pension which will entitle them to free general-practitioner treatment under the pensioner medical service scheme. The Commonwealth subsidy will also be paid to indigent people who are not pensioners.

PROFESSIONAL REPRESENTATION

In his address to the World Medical Association last September, Sir Earle Page, F.R.C.S., F.R.A.C.S., who as minister of health for Australia is chief architect of the scheme, affirmed his belief that its most important feature was that the professions took their place as active partners, and helped to control and implement it through committees chosen from their own ranks. Disciplinary and advisory committees for medicine, pharmacy, and insurance have accordingly been set up.

In Australia, on financial and political matters the whole medical profession speaks through the Federal council of the B.M.A. The Royal Australasian Colleges of Physicians and Surgeons, whose fellows are all members of the Australian division of the B.M.A., have delegated discussions on these topics to the council. From this body the Federal government have been able to get a "representative opinion on all vital matters in a reasonable time."

Other professional committees include the advisory committee which determines which drugs should be on the free list. It consists of four doctors appointed by the minister from a panel of six nominated by the Federal council of the B.M.A., a pharmaceutical chemist, and a pharmacologist, together with the director-general of the Commonwealth department of health, who is by law a doctor, or his nominee, and a secretary, who is a pharmacist belonging to the department of health. The committee recommends to the minister from time to time the drugs and medicinal preparations to be made available as pharmaceutical benefits, and advises on other matters referred to it by the minister. In the future, drugs or medicinal preparations additional to those already in use may not be prescribed except in accordance with the recommendation made by the committee to the minister.

Medical and pharmaceutical committees of inquiry have also been set up, on a Federal and State basis, to deal with professional misconduct in the pensioner and pharmaceutical services. All the members of the medical committee of inquiry are doctors—the Federal committee consisting of the director-general of the Commonwealth department of health and four members. The State committees consist of the deputy-director of health and four doctors nominated by the organised profession. Appeal to a supreme court against the report of the committee and the decision of the minister is allowed. In cases of obvious fraud and dishonesty, the government may act independently of the committees directly through their own legal department, though even these cases are usually submitted to the committee for report before action.

Public Health

Scotland in 1953

In a preliminary return for 1953 the Registrar-General for Scotland [1] reports that the birth-rate has risen for the first time since the late war. The rate for 1953 was 17·8 per 1000 population, which is 0·1 more than in 1952 but 0·4 below the average for the preceding five years. The death-rate fell by 0·5 to 11·5 per 1000 population. Deaths from all forms of tuberculosis numbered 0·26 per 1000 population, compared with 0·32 in 1952. The infant-mortality rate decreased from 35 to 31 per 1000 live births (the lowest figure yet recorded), and the stillbirth-rate from 26 to 25 per 1000 total births.

Infection from Telephones

Transfer of infection by telephone instruments has often been suspected, but no very serious instances of this have been disclosed by various bacteriological surveys. Williams [2] has found that the risk is apparently very slight.

Bacterial flora were counted in 153 examinations of telephones in central London street kiosks, in a large City office where no "disinfection" routine was followed, and in another office where weekly disinfection was practised. Swabs moistened in saline were inoculated on to blood-agar and into nutrient broth. *Staphylococcus aureus* was cultured from 7·2% of mouthpieces and 17·6% of earpieces; and one pneumococcus was found. Otherwise no pathogenic bacteria were isolated.

Laboratory experiments showed that *Staph. aureus* and *Streptococcus pyogenes* could survive for several days on the instrument, but suspended particles artificially inoculated on to it were not dislodged by an air current considerably stronger than that emitted in normal conversation. It therefore seems improbable that organisms in saliva or sputum can be dislodged by talking into the mouthpiece, or that there is any appreciable risk of its transmitting respiratory infection.

1. Quarterly Return of the Registrar-General, Scotland, for the Quarter ended Dec. 31, 1952. H.M. Stationery Office. Pp. 40. 2s. 6d.
2. Williams, R. E. O. *Mon. Bull. Minist. Hlth Lab. Serv.* 1954, 13, 52.

In England Now

A Running Commentary by Peripatetic Correspondents

THEY had applied for an indoor invalid chair and, to ensure that the need was genuine, they had been asked to attend my outpatient clinic. The patient was the husband, who told me how muscular dystrophy had begun in his right arm when he was 18. Now he was 49 and both arms, both legs, and his back were affected. Until lately, he had been able to walk a few steps, enough to allow him to get from room to room, but this was no longer possible. His wife, a plain little body with thick-lensed glasses, explained "Now I have to carry him about the flat, Doctor, and it is rather too much for me. That's why we want the indoor chair."

Undressing looked like being a tedious job requiring the help of two nurses. But the wife, bustling round like a hen with one chick, had the job finished in less than five minutes. Naked he was a pathetic sight—the great proximal muscle-masses melted away, thighs and upper arms like match-sticks, the grotesque hypertrophy of the calves unable to conceal the gross weakness of his foot-movements. Apart from his face, the only movements left to him were pronation and supination, a fair grip in both hands, and the ability to maintain, but not assume, a sitting posture. But here was no self-pity. As we talked, I learned that he managed to feed himself by having his arms placed on the table when, by supporting one elbow with one hand, he was able to convey food to his mouth with the other. He had traced the other members of his family who were affected and offered to lend me the genealogical tree. He willingly agreed to appear at a clinical meeting. At this stage something dawned on me.

"If this affliction began when you were eighteen, did you ever do any work?"

"I worked until I was twenty-one."

"When did you get married then?"

"Only a few years ago. You see my father and mother looked after me till then, but they weren't able to do so any longer. Then this lady, who was a good friend of ours, said I wasn't going to be sent away, and we got married, so she could look after me."

With a sense of unworthiness, I filled in the appropriate form. Another wheel-chair may ease their burden a little; but nothing can adequately reward this unknown heroine.

* * *

Beauty seems to be spreading. I am a peripatetic physician and journeys from one hospital to another can be varied. In the spring I always pick my way through a village which has the nicest green I know. Last month it was a mass of crocuses—purple, white, and yellow. What a poor description yellow is for that brilliant sheen in the sunshine. This month there are daffodils under the chestnut and elms. But, as so often, beauty is not effortless. I have discovered that many of the villagers subscribe half a crown a year to the upkeep of their green. Every year a few more flowers are scattered here and there in what was once unkempt grass. What is even better, other villages have imitated their neighbours. Lawns are now stocked with bulbs which will soon have their leaves braided so that the mower can do its work.

* * *

During a cocktail party the administrator of our hospital for mental defectives told me that if I needed any help in the garden of my new house he would gladly send me down a few of his "higher grades" to give me a hand.

The garden is a meadow-field stretching in gentle undulations to the still, mirrored waters of the canal. My intention is to convert it into a fine, smooth, shaven lawn on the style of the great château gardens which grace the banks of the Loire—or even those flawless, velvet lawns which hem the higher reaches of the Thames. I visualise a lawn so perfect that the sparrows would glance at their feet before alighting on it. With these ideas in my mind I grasped the administrator's offer and asked him to send me four of his best boys on the morrow.

When they arrived I selected one who looked as though he had a less elusive hold on his faculties than his colleagues. I appointed him foreman and he seemed well satisfied with his early promotion. He said I would not regret my decision. He said he had always wanted to be a foreman and that he was a liberal and believed in free enterprise. This last remark was obscure, but I did not feel it necessary to follow it up.

I told him to get his men to take six inches of the top soil away from a restricted area next the house and then to level the ground with ashes. After watching them take away a few sods to make sure they had understood my simple instructions I went to work.

When I came home for lunch I was amazed to see only one figure in the field. This was my foreman. The other three were lost in an enormous hole and spadefuls of red clay were being ejected high into the sky like the debris from some nuclear explosion. The scene was apocalyptic. The foreman was shouting frenzied orders from the brink of the crater. Ever and anon he fired a fistful of clay at a flagging colleague. This was greeted from the belly of the earth with gales of ungovernable laughter. The hole was so near the house I feared for its foundations and rushed to the garage for a hose-pipe. It was clear the men had gone berserk and a sudden drenching might, I hoped, bring them back to a sense of their responsibilities.

I was assembling the pipe as fast as I could when my wife joined me and explained that she had striven valiantly to hold up the excavations, and, when she had failed in this, to deflect them away from the house and towards the canal. But the foreman was inflexible and told her I had given him instructions to dig a six-foot hole for an ash-pit, and that he had been a foreman far too long to take advice from a woman.

* * *

At our staff meeting last week a consultant complained bitterly that much of his work could be done at registrar level. His remark is not unjustified; but raises the fresh difficulty of defining the upper limits of the houseman's lowliness and the lower limits of the consultant's elevation.

For instance, the level of the surgical registrar, with his tail-end operating-lists for hæmorrhoids and hernia, lies on a distinctly inguino-perineal plane, while that of his orthopædic colleague is governed by centrifugal force, for his endeavours are confined almost exclusively to the big toe or the little finger. In the E.N.T. terrain the pillars of the fauces form convenient landmarks, golden gates beyond which a registrar rarely trespasses. In gynæcology and anæsthetics the level is not so much a matter of height as of depth, varying in direct proportion to seniority in gynæcology, and inverse proportion in anæsthetics. Classification of the psychiatric registrar is not feasible, for one can never be certain whether his level lies above or below the id.

What about the medical registrar? Why, I see all the patients over ninety.

* * *

When Uncle Arthur, home from the East, feels an attack of malaria coming on, he retires to his room with large quantities of whisky and hot milk. This prophylactic, he finds, never fails to abort the attack. Uncle Arthur has found it necessary to take these precautionary measures more often of late and it has strained his resources, both financial and diplomatic, to maintain an adequate supply of whisky. He might be expected therefore to welcome Professor Maegraith's discovery that a milk diet is protective against malaria and that, instead of being a mere innocuous vehicle for conveying the rare and expensive active principle, the milk itself is the specific agent in Uncle Arthur's prophylactic mixture. But Uncle Arthur is not convinced. He agrees, however, that there is a strong case for a properly controlled clinical trial and he is willing, in fact anxious, to participate. With a rare public spirit he is prepared to volunteer as one of the controls receiving the prophylactic mixture from which the milk has been omitted.

* * *

We were delighted to read[1] that the opossum, *Didelphis virginiona*, has at last come into its own and is to be used in psychiatric research. We can just imagine our psycho-analytical friend conning his appointments for the day: 9 A.M., the manic; 10 A.M., the anxiety; 11 A.M., the depressive; 12 noon, the opossum. Do you think he will hang upside down from the branch of a tree during his analysis?

1. Wiedorn, W. S. *Science*, March 19, 1954, p. 360.

Letters to the Editor

TREATMENT OF HYPERTHYROIDISM

SIR,—I should like to express my appreciation of your excellent leading article last week.

There is one point, however, which is open to criticism—namely, the care of the hyperthyroid patient after operation. You imply that thyroidectomy is very similar to appendicectomy, an incident in the patient's lifetime, and that after a fortnight in hospital and a fortnight's convalescence, she returns to work cured. This is not true of the great majority of cases. The postoperative thyroid convalescence consists in two stages: the primary stage starts immediately after operation, goes on for a few weeks, and brings a great improvement in the patient's health; but very often residual symptoms, especially fatigue and nervous phenomena, linger. The complete recovery may be long delayed, and the secondary advance may occur after nine, twelve, or fifteen months. The patient may, especially if she is debilitated and the disease is of long standing, improve more during the second year than during the first. It is possible for a careful clinical observer to foresee in which cases complete recovery will be slow, and such patients are very grateful if they are told beforehand that this slow progress is no reason for despondency.

If a patient is not progressing satisfactorily three or four months after operation, the following questions should be considered. Firstly, was the original diagnosis correct? Secondly, was the amount of thyroid tissue left at operation (estimated and recorded in the notes of the operation) what the surgeon judged to be the optimum amount? Thirdly, is there any concomitant condition hindering recovery? Fourthly, is there any adverse influence in the patient's life? The last question is most important. If, for example, a woman is living alone with a sister and constantly quarrelling, or if she is harassed by a dominating and interfering mother-in-law, or if she dreads return to work because she fears an overseer who has got a hold over her, it is most unlikely (however perfect the operation) that she will recover from her nervous phenomena until the exciting cause has been removed. If all these questions can be satisfactorily answered, the patient can be told with confidence that complete recovery will occur in due time.

Treatment with thiouracil is considered to act in the same way as thyroidectomy, only more slowly. This is not quite correct, for a patient who remains uncured under full treatment with thiouracil may quickly and dramatically respond to operation. Nevertheless, the parallel is close enough to suggest that these factors, which are borne in mind by the careful surgeon during the convalescence of his hyperthyroid patients, should also be kept in mind by the physician using one or other of the modern methods of medical treatment.

Bradford. PETER MCEWAN.

KWASHIORKOR

SIR,—We agree with Professor Moncrieff [1] that discussions of the etymology of "kwashiorkor" are making heavy weather. If his suggestion were accepted that the word means "the deprived child" it would simplify the issue and fit in excellently with the concept of "protein malnutrition" in weanlings which has now been clearly defined.[2] It would also meet the criticism of Dr. Kahn [3] that the concept of redness attached to the word is preventing people from diagnosing the syndrome when the characteristic pigmentation of skin or hair is lacking.

In defence of the position which we took in our monograph,[4] we must point out that we were concerned solely with the syndrome as seen in Africa, and we were urging what we thought to be a correct etymological use of the word kwashiorkor. We are dealing with the etymology of the word in another place, but there is no doubt that when the monograph was written the accepted meaning of "kwashiorkor" was "red boy," and there seems no doubt that the native names *mbuaki* and *diboba* do refer to the special pigmentation of hair and skin. The word kwashiorkor is derived from the Ga language of the Gold Coast, and scholars of this language assure us now that it did not refer to pigmentation but apparently to the psychological state which arises when the child is deposed from the breast at the time of a second pregnancy or birth. We therefore like Professor Moncrieff's suggestion that it should be regarded as meaning "the deprived child"; this would obviate further mental gymnastics on this subject, and would fit in well with the decision of the F.A.O./W.H.O. Committee to apply the name to similar or related syndromes throughout the world.[2] A decision to abandon the concept of redness would apparently have the support of Dr. Cicely Williams [5] who introduced the word into European medical literature.

Turning to more practical considerations, we suggest that the term kwashiorkor should be used, at least in Africa, to denote protein malnutrition (subacute as well as acute), occurring during the late breast-feeding, weaning, and postweaning phase of life in regions or under conditions in which starchy paps are used as supplementary or postweaning feeds to the virtual exclusion of protein-rich foods (such as cow's milk, goat's milk, and mushes prepared from legumes, nuts, or fish). Since in Africa and many other underprivileged parts of the world the child is retained at the mother's breast until displaced by the next succeeding child, the syndrome comes to be one of the "displaced" or "deprived" child. In our monograph we confined our description to young children, although we recognised that a similar if not identical syndrome was seen at all ages in childhood, and even occasionally in adults. The new interpretations of the etymology of the word would apparently preclude its use in older children and in adults, but we leave this question open.

It is not yet clear how many of the considerable variety of physical signs and laboratory abnormalities must be present before it is legitimate to use the term kwashiorkor. The answer to this must await further knowledge of the pathogenesis of the disease. We agree that dyspigmentation of the skin and hair is not essential to the diagnosis, and that *mehlnährschaden* differed from kwashiorkor as we saw it in Africa only in the absence of the dyspigmentation of the skin and hair which is so often a striking feature of the African cases.

Dermatosis is certainly not necessary for the diagnosis, and the term infantile pellagra is misleading when applied to this syndrome. Pellagrous or pellagroid dermatosis occurs particularly in those children fed on a starchy pap prepared from maize (corn). Other types of dermatosis or no dermatosis at all may be found in those consuming other types of starchy pap. Some at least of the dermatoses are due to associated vitamin deficiency.

We agree with Dr. Kahn that this form of malnutrition may be primary or secondary, and that the syndrome may take a variety of clinical forms, but we do not

1. Moncrieff, A. *Lancet*, 1953, i, 1204.
2. Joint F.A.O./W.H.O. Expert Committee on Nutrition. *World Hlth Org. Techn. Rep. Ser.* 1953, no. 72.
3. Kahn, E. *Lancet*, 1953, i, 496.
4. Brock, J. F., Autret, M. Kwashiorkor in Africa. W.H.O. monograph series, no. 8. Geneva, 1952; *Bull. World Hlth Org.* 1952, 5, 1.
5. Williams, C. D. *Brit. med. J.* 1952, ii, 1360.

think it necessary to coin such terms as "malnutrition with fatty liver" and "malnutrition with kwashiorkor." The problem of terminology is simplified if it is accepted that the term kwashiorkor may be used to denote a spectrum of clinical states of "protein malnutrition" as defined by the F.A.O./W.H.O. Committee.[2] Each protein food differs in its amino-acid composition and is also the vehicle for other nutrients in varying combinations, the deficiency of which might, apart from amino-acids, play a part in the production of different features seen in this syndrome.

As long as the precise ætiology of the syndrome is no better defined, the name "kwashiorkor" seems to us, at least when applied to weanlings, to be as good as, or better than, any of the others in the list given in an appendix to the report.[2]

J. F. BROCK
University of Cape Town. Professor of the Practice of Medicine.

Food and Agricultural Organisation of the United Nations, Rome. M. AUTRET
Senior Nutrition Officer.

HOSPITAL BEDS FOR CHILDREN

SIR,—The estimate made by Sir James Spence and Dr. Mary Taylor (April 3) that 50 beds for children are needed for each 100,000 of population raises interesting issues in relation to the provision of children's beds in London. Comparable figures for London in 1950 are not readily available, but the following statistics of population and hospital discharges or deaths in the Administrative County of London for 1952 seem a reasonable basis for comparison:

	Newcastle 1950	*London County 1952*
Total population	294,800	3,343,000
No. of children under 15 years of age	66,130	656,000
Children as % of total population	22·4	19·6
No. of children under 15 admitted or discharged	4240	65,201
Children admitted or discharged as % of all children	6·4	9·9

The number of children discharged from London hospitals in 1952 is taken from the SH 3 returns submitted to the Ministry for that year. If anything, it is an underestimate, since only children discharged from children's hospitals or children's wards of adult hospitals are included; children discharged from tuberculosis, infectious-diseases, and mental institutions are excluded, and some hospitals did not differentiate between adult and child discharges in their returns. The proportion of children treated in hospital in London is higher than in Newcastle. Why this should be so is hard to explain, but one reason may be that many children from the Outer Ring of Greater London and elsewhere are treated in the hospitals in London County. Again, since seven of the ten general children's hospitals in the county are teaching hospitals, more beds are needed in them to meet both teaching and regional needs, and the same applies to the children's departments of the other teaching hospitals in London.

According to Spence and Taylor's estimate, at least 1675 children's beds are needed in the County of London. Exact figures of the actual number provided are not readily available, but according to the SH 3 returns for 1952, 25,070 children were discharged from the ten general children's hospitals, with a total bed complement of just over 1000 beds, and 40,131 children were discharged from the children's wards of other hospitals in the rest of the county; if the number of discharges bears any relation to the number of beds, these figures suggest that there are possibly over 2600 children's beds in London County. This figure can only be a rough approximation, since the method of calculation is not fully reliable, but it lends some strength to the argument that there may be more beds for children in London than are really needed. The occupancy-rate (averaging 83% of the beds available in 1952) and the waiting-lists (over 4300 for E.N.T. admissions and over 1700 for other reasons) of the children's hospitals do not wholly support this argument, but it would be dangerous to draw dogmatic conclusions without information about children's wards in adult hospitals and about many other variable factors.

There seems to be a case for an investigation of this kind, leading to a consideration of general policy. If either now or in the future there should prove to be more children's beds than are needed in London County, or in Greater London, should the children's hospitals be developed as centres of pædiatric treatment and education, and beds reduced elsewhere? Or should the children's departments in adult hospitals be retained and the children's hospitals be reduced in number or size? Or should children's hospitals and children's departments in adult hospitals alike be gradually whittled down by each governing body as it thinks fair?

At present these questions, and the dependent issues of medical staffing and the training of nurses, are dealt with by a variety of bodies. Patients in London County are drawn from the areas of four regional hospital boards; the ten general children's hospitals are controlled by six different boards of governors and two hospital management committees, and the children's departments of adult hospitals are controlled by over twenty-five other boards and management committees. Local-health authorities are also concerned. With so many interested authorities there is a danger that the problem, which is in many ways a regional one for London County and Greater London as a whole, may not be viewed as a whole. It perhaps merits more concentrated and coördinated attention than it has hitherto received.

London, S.W.5. M. C. HARDIE.

THE FACE IN DIAGNOSIS

SIR,—I have read and re-read the interesting article by Pierrhos StKatsareas.[1] I should like to add to his long list a few more conditions in which the face carries stigmata of disease.

(*a*) In pellagra, the face, neck, and a V-shaped portion of the front of the chest show characteristic dermatitis. On the face this is often symmetrical and butterfly-shaped.

(*b*) In Egypt, it is common to see patients who have a pale face and chronic enlargement of the parotid glands—so-called endemic parotitis—a condition often found in patients with ankylostoma anæmia, although the connection between the two conditions is not clear.

(*c*) The face of the patient with liver abscess has a typical earthy colour.

(*d*) The patient with advanced carcinoma of the urinary bladder, cystitis, and ascending pyelonephritis has a typical appearance, though this is difficult to describe.

(*e*) The child with cervical Pott's disease is easily recognised because he is continually supporting his chin with his hand.

(*f*) In gargoylism the face and the skull show characteristic features. The face has a peculiarly unchild-like look reminiscent of Tenniel's illustrations of the Duchess in "Alice in Wonderland." Whereas the hair is often fair and silky, the eyebrows are almost invariably dark and coarse. The eyelids, nose, and lips are grossly thickened. Deep creases run from the nose to the angles of the mouth. The bridge of the nose is depressed. In some cases, there is a moderate degree of hypertelorism. Distension of the skull veins has been described, the frontal veins lying in deep gutters. A characteristic feature is clouding of the cornea by multiple opacities. The skull varies considerably in size and shape, and is commonly enlarged. It has been described in different instances as hydrocephalic, scaphocephalic, and acrocephalic.

1. StKatsareas, P. *Lancet*, 1953, ii, 929.

St Katsareas's article included mumps, facial erysipelas, and labial chancre, so this may justify the mention of some other conditions in which the face is involved :

Rodent ulcer ; epithelioma ; leishmaniasis ; lupus ; dermoid cyst ; sebaceous cyst ; sebaceous adenoma ; sebaceous adenocarcinoma ; the various swellings connected with the parotid gland, including Mikulicz's syndrome and uveoparotitis ; reticulosis (including Boeck's sarcoid) ; the various swellings of the upper and lower jaws ; pachydermatocele and the café-au-lait patches of von Recklinghausen's neurofibromatosis ; secondaries in the face, scalp, and skull from a malignant primary elsewhere ; the various angiomata, cirsoid and arteriovenous aneurysms ; prognathism and congenital recession of the mandible ; and proptosis, unilateral or bilateral, pulsating or non-pulsating.

The face may also bear stigmata of past trauma, surgical or otherwise :

Burns and Horner's syndrome (mentioned by St. Katsareas) auriculotemporal syndrome (mentioned by Dr. Parkes Weber [2]) ; drooping of the angle of the mouth following damage to the cervical branch of the facial nerve after operations high up in the neck ; complete or partial paralysis of the facial nerve after operations on the parotid gland ; deformity of the jaw after dislocation of the temporomandibular joint or operations on the joint or the mandible ; and deformity due to depressed fracture of the zygomatic arch, fractured maxilla or mandible.

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Faculty of Medicine,
Cairo University,
Egypt.

FAYEK GHABRIAL
Lecturer in surgery.

THE CURABILITY OF CANCER

SIR,—I have read with great interest your leading article of April 3, which includes references to cancer education and early diagnosis. The value or otherwise of such education, even in the case of the breast, has not been proved, and still less for the other accessible cancers. Surely this part of the problem is of sufficient importance to justify further intensive research, which should be carried out " step by step," as indeed is being done on a small scale by the Yorkshire Council of the British Empire Cancer Campaign. Another experiment, I understand, is being carried out under the auspices of the Manchester Radiotherapy Centre, but there is room for much more investigation.

There are 5 fundamental questions to which answers are needed, in the following order :

(1) Will intensive education cut down the delay in reporting certain symptoms (about seven in number), whatever the cause *may* be, but which may suggest the presence of an *accessible* cancer in the breast, uterus, rectum, tongue and mouth, larynx, lip, and skin ? Probably this is the only question likely to be answered by the small Yorkshire experiment.

(2) If the delay is cut down, will it result in an appreciably greater number of clinically early-stage *accessible* cancers being treated in hospital ?

(3) If a greater number of early-stage accessible cancers are treated at hospital, will the " five-year cure-rate " of these accessible cancers be increased ?

(4) If the " five-year cure-rate " is increased, will it result in a lower mortality from these accessible cancers ?

(5) Will cancer education increase the apprehension, which at present exists in almost 100% of the population, or increase real fear, which happily exists in only a small proportion of the public ? If it was proved that apprehension and fear were increased, this would be a very serious objection to public education, even if this could save a few thousand lives.

It would seem that Professor McKinnon believes the answers to (1) and (2) in cancer of the breast are in the affirmative, although exact critical figures published are few ; and that the answer to (3) may be in the affirmative owing to the inclusion of a large number of non-metastasising, " non-lethal cancers." He seems convinced that the answer to (4) is in the negative. The 5th question is very difficult to answer. In my opinion, after giving about 120 lectures within the last year to several thousand lay people, the psychological effect of such education is good ; and the votes taken at the end of some of those lectures are overwhelmingly in favour—3348 in favour and 10 against. One thing is quite certain : if cancer education increases fear and apprehension, it will defeat its own purpose—namely, to get early diagnosis.

Everybody will agree that the most important factor governing the mortality from cancer is the type of tumour ; but the question still remains, Are there a sufficient number of late metastasising but still " lethal " cancers to justify every effort to get the earliest possible diagnosis and treatment ? Only a large-scale experiment on the lines suggested above can prove or disprove this.

British Empire
Cancer Campaign, York.

MALCOLM DONALDSON
Director of Cancer Survey.

2. Parkes Weber, F. W. *Ibid*, p. 995.

BENZATHINE PENICILLIN IN YAWS

SIR,—Much attention has lately been given in the British medical press to the side-effects of antibiotics. Although penicillin has been used for a longer period than other antibiotics, its side-effects have only recently been appraised more thoroughly. Efforts have been made to develop penicillin-derivatives, such as allyl-mercaptomethyl penicillin, causing fewer sensitivity-reactions, and clinical trials have been undertaken in search of salts of penicillin with repository effect which would obviate the use of procaine or oily components now contained in repository preparations—e.g., procaine penicillin G in water or in oil with aluminium monostearate (P.A.M.). Thus, benzathine penicillin (N'N' dibenzylethylene-diamine dipenicillin G), also known as diamine penicillin, ' Penidural,' ' Bicillin,' ' Tardocillin,' &c., and benethamine penicillin (N'benzylphenylethylene-amine penicillin G), also known as ' Benapen,' have been described for oral and parenteral use in various infections.

The treponemacidal serum-levels obtainable with benzathine penicillin—a penicillinæmia of 2–3 weeks' duration follows a single injection—has made it an even more promising drug than P.A.M. in the treatment of syphilis. Recently this salt has also been tried in the yaws programme of the Thailand health administration. Among 236 yaws patients, some with early infectious yaws and others with palmar and plantar hyperkeratosis, side-effects were recorded in 11·2% of cases : 2·5% of the patients said they had been feverish for 2–5 days after the injection ; another 5·6% had fever plus pain at the site of injection ; and 3·1% had local pain only. On the other hand, there were no local or general skin-reactions or allergic responses in this series. Admittedly the reactions were assessed from the patient's own stories (no temperature measurements were taken), but their incidence was considerably higher than that reported (1%) with benzathine penicillin (and with P.A.M.) in the treatment of early syphilis in American patients. On the other hand, it is remarkable that the types of local and general skin-reactions and allergic responses which were commonest during the treatment of syphilis in the U.S.A. were not recorded at all among the yaws patients in rural Thailand. This suggests the importance of sensitisation by the widespread use (and misuse) of penicillin in industrial areas where the antibiotic is freely available, as contrasted with areas where the population has had no penicillin. There is also the possibility of a different underlying general tissue-response to stimuli of this kind.

In Thailand, two treatment schedules were used—namely, 0·6 and 1·2 mega-units of benzathine penicillin, given in a single injection. No difference in results between the two schedules was observed in either of the

two groups of patients. The clinical and serological effects after six months were excellent: complete healing of lesions took place in 98·0% and 89·7% of the early infectious yaws and the hyperkeratosis group respectively. While 14·3% of the patients in the former group became serologically negative, no case of hyperkeratosis showed complete reversal after six months. There was significant improvement in serum titres (quantitative V.D.R.L. tests) in both groups, the average improvement in titre representing 2·83 and 2·34 tubes in the two series. These results were better than those given by 2·4 mega-units of P.A.M. under similar circumstances in the same rural areas of Thailand.

World Health Organisation, Geneva.

E. I. GRIN
T. GUTHE.

DOSAGE OF MEPHENESIN

SIR,—In his letter of Dec. 19 Dr. Peckover discusses the dosage of mephenesin necessary for the effective treatment of various "rheumatic" complaints encountered in general practice.

I have found that mephenesin, administered in the single doses suggested by Peckover and Nesbitt, gives rise to troublesome side-effects, especially nausea and, less frequently, vertigo. Thus, when I obtained some compound tablets in which mephenesin did not exceed gr. 1 per tablet, I tried them and was impressed by their equal if not superior effectiveness, quite apart from their undoubtedly lower toxicity. By cutting down the single dose and combining it with other drugs, the daily amount of mephenesin could even be stepped up with advantage to a total of gr. 9–12 plus the other effective drugs, such as salicylates. This suggests that compound tablets have a useful effect on the pain and spasm, and that side-effects are rarer. The promising future of mephenesin in antirheumatic therapy may lie in its combination with other drugs rather than in its use alone.

Miller Bay Hospital,
Prince Rupert,
British Columbia, Canada.

D. F. CROSS.

ON CREDULITY

SIR,—As a nurse and a member of a family of doctors, I have been brought up on orthodox views of medical science. Like many people, I have seen the failures of medicine, but I have also seen the brilliant results of team-work. So it was with interest that I read Lord Moran's story (Jan. 23) about his friend's experience of osteopathy.

I recall some years ago saying to a friend that I firmly believed that orthodox medicine could offer all that the unorthodox approach to healing could do, especially in orthopædic surgery and physical medicine. Little did I know how my faith was to be tried.

Some 18 months later I had an acute attack of sciatica, and the pain was very bad. I was told that the cause was a prolapsed intervertebral disc, and I was treated with rest and drugs. I was able to get about for a while, but the acute pain soon returned. A specialist advised me that manipulation under anæsthesia was needed, but it only made the pain worse.

In the weeks that followed I received various forms of treatment, including spinal traction, a plaster jacket, and further rest in bed, but I was still in acute pain and unable to carry out my duties. Even so, my faith was not shaken: I must be, I told myself, a very resistant case. So when, some 7 months after the pain began, a nursing sister suggested a visit to an osteopath, I was not keen at first, but the pain made me change my mind.

Unlike Lord Moran's friend, I found that my initial consultation included a very thorough history-taking, and a careful physical examination. Treatment was delayed until radiological confirmation was obtained. The osteopath told me that the manipulation under anæsthesia had been a bad mistake, which I quite believe. Treatment was not in any way forceful, and after the fourth visit the pain had gone from my leg, and with a further four treatments it had disappeared altogether.

I have talked to many of this osteopath's patients, most of them with a similar history to my own, and I have come to the conclusion that a lot of suffering could be eased, if not cured, by immediately seeking the advice of an osteopath.

Banstead. C. THOMAS.

TUBO-OVARIAN TORSION AND TORSION OF HYDROSALPINX IN CHILDHOOD

SIR,—The following two cases seem worth reporting because, although it is mentioned in some standard textbooks, acute tubo-ovarian torsion in childhood does not appear to be common. The clinical picture resembles that of acute appendicitis, and its true nature is disclosed only by laparotomy. Moreover, although torsion of ovarian cysts in infancy and childhood is not uncommon, I can find no record in the standard works of torsion of hydrosalpinx in a child. Most authorities state that this condition occurs only in adults and as the end-result of long-standing pyosalpinx in which the pus has long been resolved and clear fluid left. In the second case there was no history of long-standing pelvic disease and no evidence at operation of any prior pelvic disease.

CASE 1.—A girl, aged 7, was admitted to hospital on Dec. 6, 1953. Forty-eight hours before admission, she felt sick and vomited several times during the evening and the night, and apparently had generalised colicky pain. Twenty-four hours later, the pain settled in the right side and persisted until admission, keeping her awake at night. Her bowels had not been open since the onset of pain. There was some increased frequency of micturition and dysuria during the twelve hours before admission.

She was a healthy-looking youngster. Her temperature was 100·2°F. There was tenderness and rigidity in the right iliac fossa. Laparotomy was performed on the night of admission. A right transverse gridiron incision was made; there was some free fluid in the peritoneal cavity. The appendix was normal. There was torsion of the right ovary and tube, both of which were gangrenous. The right ovary was filled with blood-clot, and was about 3 in. by 2 in. in size. The right tube was $^3/_8$ in. in diameter, and gangrenous to within $^3/_4$ in. of the uterus. Right salpingo-oöphorectomy and appendicectomy were performed. Postoperative convalescence was uneventful.

The pathologist reported hæmorrhagic infarction of the ovary and fallopian tube.

CASE 2.—A girl, aged 13, was admitted on Dec. 6, 1952. Three days earlier she had had intermittent pain in her back, and she had vomited once. The pain had recurred in the left loin, and for the past twenty-four hours had been constant in the lower abdomen. During the past twelve hours micturition had been painful. The bowel action had been normal, but there had been some frequency of micturition during the past two days. Her periods had started two months ago.

She looked healthy. Her temperature was 100·8°F. There was some tenderness in the left lower quadrant and the hypogastrium, and in the pouch of Douglas on rectal examination. Laparotomy was performed on the day of admission, using a right transverse gridiron incision. There was blood-stained fluid in the peritoneal cavity and a normal appendix. Torsion of the distal two-thirds of the left fallopian tube had made it purple and gangrenous, and it was distended with blood to a diameter of 2 in. The left ovary was normal. The right ovary contained a small cyst filled with blood. The right tube was normal. Left salpingectomy and appendicectomy were performed.

Postoperative progress was uneventful and the patient was discharged on Dec. 16, 1952. When seen at outpatients on Jan. 8, 1953, she was quite well.

The pathological report described hæmorrhagic infarction, suggesting torsion of a hydrosalpinx.

Hackney Hospital,
London, E.9.

R. F. READ.

TREATMENT OF VARICOSE ULCERS

SIR,—It appears to me that, in his letter of April 3, Mr. Lee is only adding to the "multitude of treatments" and "maze of medicaments and bandages" to no advantage by the injection of tolazoline and hyaluronidase in the treatment of varicose ulcers.

The ulcer which results from the presence of varicose veins is a common one and is easily cured by the removal of the varicose veins. Injections alone play no part in this treatment, and the correct treatment is a Trendelenburg operation plus ligation of all incompetent communicating veins.

The ulcer arising as a post-thrombotic incident is probably even more common. It is wrong to imagine that arterial spasm plays any part in the onset or the chronicity of these ulcers in the ordinary case. I have performed very many arteriograms on these cases and have never found arterial spasm to be present. The post-thrombotic leg may indeed be an "inverted Guinness bottle," and in these cases a supporting bandage is of no value whatsoever, for there is no œdema of the foot or lower leg. A more common type of post-thrombotic leg is one with chronic hypostatic œdema, and in these cases supporting bandages are invaluable, for it is to prevent the accumulation of œdema that the bandages are required and not to get rid of "accumulated metabolites."

It is again incorrect to state that "ligation of the communicating vein does not have any effect"; in most cases it has a very dramatic effect, but to perform the ligation the ulcer has usually to be excised.

Varicose ulcers and post-thrombotic ulcers may be healed and prevented from recurring in most cases by Bisgaard treatment and supportive bandages. A cure can be effected, however, by adequate surgical elimination of incompetent varicose veins in both types of ulcers—plus the ligation of incompetent deep communicators (the "ankle blow-out syndrome"). A chronic ulcer may have a base of fibrous tissue at least an inch thick, and I have excised many like this. Surely the best treatment is to get rid of this thick avascular fibrous tissue, and a graft will then have some chance of remaining alive with a healthy blood-supply.

For the really bad cases, lumbar sympathectomy is invaluable to improve the nutrition of the skin. I can see little reason to support repeated intra-arterial injections with their very temporary effect, nor can I subscribe to the repeated needling for the purpose of injecting hyaluronidase which will only spread the œdema over a wider area—in an area which is very susceptible to infection and ulceration at the best of times. Neither of these two methods appears to me to "attack the underlying condition."

Essex County Hospital, Colchester. ROLAND N. JONES.

SIR,—Has not Mr. Lee succeeded only in misting a little further the windscreen of varicose-ulcer treatment? To use his own words, we are bogged down already with "a multitude of treatments" and a "maze of medicaments"; but he has no compunction in thrusting intra-arterial tolazoline injections and hyaluronidase ionisations into our already bulging knapsacks.

To me it has always been a source of mystery why the treatment of gravitational ulcers should be so fraught with difficulty, when all that is necessary is to read *The Lancet* of Feb. 28, 1931—and act accordingly. Particularly in these days when the introduction of 'Poroplast' flexible adhesive bandages has virtually banished the bogy of skin sensitivity. May I hasten to add, however, that poroplast is to my mind a most misleading name: the porosity of the bandage matters not two hoots. What is important is the new plaster spread, which seemingly contains no irritant substances.

I have, up till now, steadfastly maintained that all gravitational ulcers (except in bedridden patients and those over ninety years of age) can be healed with elastic adhesive bandages—*unless the skin is sensitive, when they must go to bed.* With this latest development in the adhesive spread, I withdraw my *italics*.

London, W.1. STANLEY RIVLIN.

*** Our issue of Feb. 28, 1931, contained an article by Mr. Dickson Wright on the Treatment of Indolent Ulcer of the Leg.—ED. L.

BLINDNESS AND OXYGEN

SIR,—In your leading article of Jan. 9 you mention the interesting experimental work by Ashton et al. and Patz et al., who produced evidence incriminating oxygen in the development of retrolental fibroplasia.

We published in 1952 a preliminary report [1] in which we described changes occurring in newborn mice that had been intermittently exposed to an atmosphere of 100% oxygen. These changes consisted of hæmorrhages into the vitreous body and behind the iris, persistence and hyperplasia of the tunica vasculosa lentis, and detachment and folding of the inner layer of the retina. These studies are continuing.

Karolinska, Mediko-Kirurgiska Institutet, Stockholm. LARS GYLLENSTEN
BO HELLSTRÖM.

TUBERCULOSIS YARDSTICKS

SIR,—The success of modern advances in the treatment and diagnosis of tuberculosis is reflected in the rapidly falling mortality and the persistently high level of new notifications, but, as Dr. Tattersall points out in his letter of April 3, these rates are of no value in assessing the success or otherwise of our attempts to lessen the frequency of tuberculous infection or even bring about the eradication of the disease.

Dr. Tattersall and his colleagues [2] have shown us the most useful yardstick for this purpose: it is the incidence of tuberculous infection in the school-child as measured by the tuberculin skin-test. This test in its various forms is being more widely used, as part of the routine school medical examination, to discover children infected with tuberculosis so that their contacts can be examined and the source of the infection traced.

It would therefore be a simple matter for the school medical officer to publish the incidence of infection in the various age-groups and in different schools. From these figures it would be possible to compare the incidence of infection area by area and school by school for the whole country. Efforts to discover the sources of infection could then be concentrated in those areas showing a high incidence of infection, particularly in the younger age-groups. Yearly changes in the incidence would indicate the success or failure of our efforts to control the disease.

Dr. Tattersall suggests a list of "active cases" as another yardstick. All would agree with the value of such a list, particularly if plotted on a street or parish map of the area and related to the incidence of childhood infection and the tuberculous morbidity of the area. An "active case" is difficult to define and must depend largely on the result of bacteriological examination of sputum and laryngeal swabs. Even more difficult will it be to say when a case ceases to be active; must there be one, two, or three negative sputum or laryngeal swab cultures and at what intervals?

1. *Acta pædiat., Stockh.* 1952, **41**, 577.
2. MacDougall, I. A., Mikhail, J. R., Tattersall, W. H. *Brit. med. J.* 1953, i, 64.

An investigation (unpublished as yet), recently made at the Ipswich chest clinic, has shown that child contacts of patients with radiological evidence of tuberculosis but repeatedly negative sputum cultures have a significantly higher rate of infection than do normal school-children in this area. This suggests that we cannot rely upon bacteriology in determining the infectiousness of a particular patient, and it is just these patients that should be included in the "active case" list; but by what criteria?

Chest Clinic, St. Helen's Hospital, Ipswich.

CHARLES J. STEWART
D. VAN ZWANENBERG.

HOSPITAL, DOCTOR, AND PATIENT

SIR,—Your correspondent, "Parent" (April 3), has indeed been unfortunate in her experience of reticence and silence on the part of the hospital concerned. Any parent or relative can interview me or my assistant merely by asking the ward sister for an appointment (or by writing to request one). Under no circumstances is such an interview refused.

Similar practices apply in most of the hospitals I know.

Orthopædic and Accident Department, Oldchurch Hospital, Romford, Essex.

R. A. KING.

NEW TANK RESPIRATORS

SIR,—In your annotation of April 3 you suggest that the dome system incorporated in the Bristol respirator, described in the same issue, is of such a complex design that construction is a difficult matter.

In actual fact the design of the dome system is very simple and uses the pump unit on its positive stroke, the pressure being regulated by a simple "blow-off" valve. The use of this dome is so easy that it can be learned in a few minutes by an intelligent nurse, and the switch-over from negative pressure in the tank to positive pressure in the dome is so smooth that patients hardly notice it has happened.

In my experience positive pressure maintained through a face-mask is uncomfortable for the patient, who requires education in the use of this method, and it is a difficult technique which cannot be readily left in the hands of nurses.

Ham Green Hospital, near Bristol.

JAMES MACRAE.

SPONDYLOSIS

SIR,—I would not venture to criticise Sir Russell Brain's oration, published in your issue of April 3, had it been confined to the clinical aspects of his subject, but some of his statements are on radiological matters and may mislead those who look to him for guidance.

Sir Russell states: "Look back for a moment and recall that it is just twenty years since sciatica was first attributed to an intervertebral disc protrusion." Though the clinicians may not have noticed it, radiologists have been drawing attention to disc lesions for much more than twenty years. He will find evidence of this in my Robert Jones lecture,[1] written in 1926.

Radiologists are well aware that radiographs may show extensive changes of the nature of spondylosis and yet the patient at the time may exhibit few or no clinical signs; and that there may be prominent clinical signs in cases with little or no radiographic evidence. The radiographic signs are the end-result of a series of changes and not the cause, and, as I have shown, there is a long latent negative radiographic period between symptoms and radiographic signs. Why then does Sir Russell urge multiple views of the spine to show the lesser signs? Surely it is the clinical manifestations which matter.

He says "without the flexed and extended lateral views it may be impossible to detect spondylolisthesis (fig. 4)." Surely an ordinary lateral radiograph would have revealed the lesion shown in fig. 4? I fear that his advice will lead to very considerable waste in time and material to get that which contributes little. And is not this use of the term spondylolisthesis unjustified in such a case? The term was introduced by Killian in 1852 to denote progressive gliding of an unstable vertebra; but fig. 4 gives no indication of this.

Some may find it hard to understand Sir Russell's advice that "it is important to bear in mind the following points in the interpretation of the X-ray appearances . . . *the absence* of posterior osteophytes, *which are radiographically visible*, does not necessarily mean the absence of a disc protrusion" (my italics). I rather fear that this may tempt the surgeon to interfere, leaving the patient worse than before.

Sir Russell Brain concludes his article with the statement: "How much we have learnt since then!" I suggest it would be better to ask: "How much have we learnt since then?" My answer would be that apparently nearly everything remains to be discovered, for have we not overlooked the common causes for the acute signs when radiographic changes are absent or minimal? And have we not neglected the preventive measures of disciplined rest and elimination of metabolic and infective toxins which bring degeneration of the discs?

Birmingham.

JAMES F. BRAILSFORD.

SIR,—Thanks to Sir Russell Brain, the neurological symptoms of spondylosis are being more often recognised and better understood. It is less widely known that the protean manifestations of this disease may comprise dysphagia and recurrent laryngeal nerve palsy, which bring the patient to the laryngologist.[1]

The patient, middle-aged or elderly, complains of the feeling of a foreign body in the throat, "like a crust," which makes him want to swallow. Radiography shows the typical appearances of cervical spondylosis in the postcricoid region, involving C5, C6, and C7 (see figure). The dysphagia is not due to a mechanical obstacle caused by the presence of osteophytes, but to reactive changes in the areolar parapharyngeal and paræsophageal tissue, resulting in fixation and impaired mobility of the pharyngeal wall. One or both recurrent laryngeal nerves, which are surrounded by this tissue, may become involved. Œsophagoscopy must be performed in order to exclude postcricoid carcinoma, but cervical spondylosis undoubtedly accounts for a number of cases which are wrongly dismissed as "hysterical" dysphagia or "idiopathic" recurrent laryngeal palsy.

Liverpool. 22.

FRANCIS BAUER.

1. *Brit. J. Surg.* 1929, **16**, 594.

1. Bauer, F. *J. Laryng. Otol.* 1953, **67**, 615.

Parliament

The Budget

ON April 6 Mr. R. A. BUTLER, the Chancellor of the Exchequer, presented what he described as a carry-on budget. He made only minor changes in the existing basis of taxation. For the social services in 1954–55 he has set aside £1327 million, and he pointed out that it takes the whole of the taxes from tobacco, beer, spirits, and purchase-tax to provide this sum. The National Health Service's share has gone up from £411 million for last year to £430 million. Progress in social reform, Mr. Butler believed, had been well maintained. Such progress carried heavy obligations from which there was no miraculous and painless escape. "We cannot," he said, "in good conscience, put the clock back; but we must make sure that in the administration of this vast outlay humanity goes hand in hand with economy."

Health and Welfare

In the House of Lords on April 7, Lord SALTOUN moved

"That in the opinion of this House a large proportion of the failures in the welfare and health services are due to imperfect coördination between the various authorities concerned, that local resolution of difficulties is essential to an efficient service, and that in many cases greater local discretion, financial and administrative, would result in better service at less cost."

He began by reading a list of some of the departments and authorities concerned with the functions of the Welfare State. If all these bodies acted in complete harmony it would be little short of a miracle. But the field of exercise of their functions was the body of one unfortunate man, woman, or child who suffered when these august parties were dilatory or disagreed. Division of responsibility often aggravated shortages of accommodation; and many hospital administrators and welfare workers were convinced that there was an urgent need to have someone with the power of commanding an emergency bed in a hospital and deciding on the spot how any urgent case should be dealt with. Old people, in particular, fell into the gaps between National Assistance, local-authority welfare, national hospital, and local-authority sociomedical services. If the Government could not accept the motion, Lord Saltoun hoped they would appoint a small committee to find how better coördination of these services could be achieved.

Lord BEVERIDGE welcomed Lord Saltoun's motion, but deprecated the use of the word "failure" about a great service. But he agreed that there were things which could be improved, largely by coördination. One way in which the National Health Service Act had tried to correct discoördination was by the institution of health centres. But up to the present the dream of establishing those centres had failed nearly everywhere. In the intention of all who framed the National Health Service, health centres were an essential measure for coördinating the different regional authorities. Their development was stopped in 1948 owing to the need to limit building. In his view, health, and the proper provision of health, were as important as houses. Would the Government remove the restrictions that prevented health centres from coming into being? He also asked the Government to release the regional hospital boards from some financial controls. The Treasury rule of annual budgets was inappropriate, and more freedom of capital expenditure was needed to replace out-of-date buildings and equipment. Our only chance to save on pensions for the aged was to lengthen the average working life; and that depended, among other things, on health. When the Government received the report of the Guillebaud Committee he hoped they would take the opportunity to consider the administration as well as the finances of the N.H.S. Would they ask themselves whether a Minister with an ordinary central department of ordinary Civil Servants was the right organisation for running a great national industry to secure for the people of this country the means to health?

The Earl of CRANBROOK, who is chairman of the East Anglian Regional Hospital Board, thought that it would be unreasonable to allow hospital authorities to carry over unspent balances of funds provided for running expenses, but he would like to see a carry-forward allowed for capital expenditure and ordinary maintenance expenditure on buildings. Constant pressure was brought on the Minister to provide more hospital beds, but Lord Cranbrook thought that the existing number of beds, certainly for acute cases, was sufficient to meet the need if proper use was made of them and there was a more rapid turnover. That could only be done if there were more home helps and home nurses. There must also be constant coöperation between the responsible authorities. An extraordinarily untidy machine had grown up, he thought quite fortuitously. The machine could be made to work by constant care and effort, but he thought the effort would be better spent if it were directed into making one machine instead of trying to make three work in together. As he saw it there were two possible solutions: the first was to hand the hospitals over to the local-health authorities and the second to hand the domiciliary services over to the hospital authorities. To hand the hospitals over to the local authorities would only be useful if the local authorities were to bear part of the cost on local rates. He was surprised to see a former Minister of Health [1] suggesting that local authorities should act as the Minister's agents in administering the hospitals while the Minister continued to pay the cost. An agent, he felt, could not publicly oppose the Minister. An agent could only resign, and as local authorities were run on party lines he felt the position would be untenable. For the same reason he disliked the suggestion that members of hospital boards and committees should be elected.

Lord AMULREE thought that elderly people suffered most from the lack of coördination between the health and welfare services. The National Health Service and National Assistance were two parallel lines, and like parallel lines they never met. The people who fell between the lines were those not strong enough to stand on either side—frail, infirm, and elderly people. There might be a good deal to be said for compulsory power to admit people to hospital, but there was also something to be said against it. As things were now the hospitals might become overfull, and overcrowded wards led to overworked staffs, and lack of proper treatment and nursing. If elderly people were treated properly in hospital and then discharged, beds would be available for all and emergencies would rarely arise. What he thought was needed was free exchange between welfare institutions and hospitals. Local authorities should provide more free accommodation for the frail and infirm and encourage the provision of domiciliary services. There was another reason why he pressed for coöperation. In 1901 the total number of people in the medical and auxiliary services was about 3000 per million of the population. In 1951 it had gone up to nearly 10,000 per million of the population. That was rather alarming, because it showed that the supply of staff was going to dry up. He had no wish to cut down the amount of work done; on the contrary, he was in favour of expanding it. But he would like to see whether something could not be done to prevent overlapping.

Lord MANCROFT, replying for the Government, could not accept Lord Saltoun's motion as it was worded, but he was prepared to accept it in spirit. There was no complacency about the health and welfare services in the minds of Ministers charged with administering them. Coördination was one of the greatest single problems of the service. Over 50,000 people were engaged in it and it was the third biggest concern in the country. At present coördination was secured by the interlocking membership of statutory bodies and joint standing committees. Like so many other problems it really resolved itself into one of human relationships. The suggestion that there should be all-purpose local authorities for all parts of the health and welfare services presented difficulties. Few local authorities had areas large enough for the planning, and perhaps operation, of a comprehensive hospital service. Nor was he convinced that all-purpose authorities would resolve the problem. In an authority of that size coördination of its different departments would not in practice be a great deal easier than the coördination of different authorities. In such a large

1. *Municipal Journal*, March 12, 1954; see *Lancet*, April 3, 1954, p. 723.

service there must be some central control, but the Minister was anxious that the spirit of the National Health Service Act should be generously interpreted and that local bodies with local initiative and responsibility should run the service in the way which best suited the needs of their locality.

Turning to the question of the aged, he suggested that we must make certain that they were not demanding of the State higher services than their needs really required. In 1911 there were $2^3/_4$ million people over pensionable age; in 1947 the figure had risen to $6^1/_2$ million, and in 1977 there would be $9^1/_2$ million. In England and Wales there were 54,000 staffed beds for the chronic sick and 3600 of those were empty for lack of nursing staff. But it was the turn-over of beds which really mattered. In 1951 the number of beds increased by 3·3%, while the number of patients treated increased by 10·1%. In 1952 comparable figures were 1% and 9%. Outpatient attendances had risen from 7000 in 1950 to 14,000 in 1952, inpatients rose from nearly 85,000 in 1950 to 103,000 in 1952, and the waiting-list had been kept fairly steady at about 9700. In residential accommodation provided by local authorities there were now some 66,000 places in England and Wales, and since the end of the war about 600 homes, with accommodation for about 18,000 persons, had been provided. Health centres, of which there were now four —in London, Bristol, Nottingham, and Faringdon—must, he admitted, still be regarded as experimental. They were expensive to build and had not been as popular either with patients or doctors as had been expected. An alternative was the establishment of group practices, and executive councils could now offer interest-free loans to groups of doctors to acquire or convert buildings for this purpose.

In his view, Lord Mancroft ended, the trouble with the Welfare State was that too many people worried about what they could get out of it and never bothered to think about what they could put into it. If the Good Samaritan on the road between Jerusalem and Jericho had stopped to look at the battered body of the wayfarer he would (if he had thought the way some people did now) have thought to himself, "Now I wonder whether it is the medical officer of health for Jericho whose job it is to look after that chap, or that of the Jerusalem City Council"; and he would have gone on his way.

QUESTION TIME

Distribution of Welfare Foods

Replying to a question, Major GWILYM LLOYD GEORGE, Minister of Food, said that the local-health authorities had been invited to take over the responsibility for the distribution of welfare foods, other than liquid milk, when the local food offices were closed later in the year, as part of their duty under the National Health Service Acts to provide for the care of expectant and nursing mothers and young children. The associations of authorities covering England and Wales had already agreed to do so.

Contamination of Citrus Fruits by Thiourea

Replying to questions on the possible toxic effects arising from the contamination of citrus fruits by the use of thiourea Major LLOYD GEORGE said that he was advised that the sale and importation of any article of food containing thiourea contravened the Preservatives in Food Regulations or the Imported Food Regulations respectively and that such sale and importation were therefore prohibited. Food and drugs authorities and port health authorities were so informed last January. The matter had been brought to the attention of the governments of the exporting countries.

Mr. A. W. J. LEWIS: Will the Minister consult the President of the Board of Trade with a view to taking some action? In the East End of London, and particularly in West Ham, these oranges are being sold at the moment and children are sucking the orange skins, which he will agree is very dangerous. I am informed that, unless he and his right hon. Friend implement the banning of these articles, the local authorities have not the powers to take action. Will he implement the banning? Major LLOYD GEORGE: At the moment the local authorities and the health authorities have full powers to deal with this because thiourea is a preservative which is not allowed. Therefore it is a matter for the courts to decide whether an offence has been committed. The prohibition on imports is an important matter, and I am looking into it urgently to see what can be done if these regulations are not sufficient. I circularised all local and health authorities on Jan. 25, pointing out the danger of this particular spray. They have full powers to deal with it. All information which I have received from various parts of the country has come from local authorities.

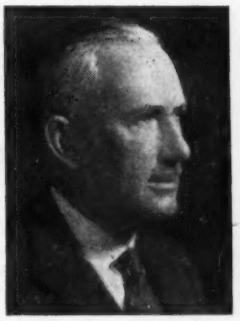
Obituary

THOMAS CARNWATH

D.S.O., M.B. R.U.I., D.Sc.Belf., D.P.H.

Dr. Carnwath, whose death on April 2 we announced last week, was deputy chief medical officer of the Ministry of Health in the anxious years that preceded the late war. His wide knowledge of medical administration went back to the days of the Local Government Board, and after his retirement in 1940 he accepted the charge of reviewing Belfast's health services.

He was born in 1878, the son of J. Carnwath of Tyrone, and he was educated at Foyle's College, Londonderry, and Queen's University, Belfast. After he graduated as M.B. in 1900 he continued his studies at the University of Berlin. His early experience of public health was gained as an assistant at the Hamburg Institute of Hygiene and later at the Reichsgesundheitsamt in Berlin, and his first papers were written in German on such subjects as Hühner Diphtherie und Geflügelpocken and the Technik der biologischen Untersuchung kleinster Blutspuren. He returned to this country to take the D.P.H. in 1906 and to become the assistant M.O.H. for Manchester, and later M.O.H. for Withington. He continued his biological studies, but his papers now dealt with such topics as a Bacteriological Survey of Belfast Lough and an Experiment on Quarantine of Shell Fish from Polluted Areas.



[Elliott & Fry

From Manchester he moved to London to take up an appointment as medical inspector under the Local Government Board, but his work there was interrupted by his war service. His cheerful gallantry in the early days in France in 1914 is described in the regimental history of the Honourable Artillery Company, to which he was attached as a surgeon captain. Later he served in the Balkans, and in 1918 he was awarded the D.S.O.

After the war he joined the staff of the newly formed Ministry of Health in the section of general epidemiology, where he was second in command to Sir George Buchanan. J. A. G., whose "early efforts" at the Ministry were in the main directed by Carnwath, recalls him as "genial, handsome, and debonair. He had great charm as well as great ability and wise judgment. For nine years I served under him, and he was always kind and ever cheerful."

After 1928 Dr. Carnwath was responsible for the complicated and technical work of administering the Therapeutic Substances Act, which controls the sale of biological products such as vaccines, sera, antigens, and insulin. During the immediate pre-war years he also took an important share in the Ministry's preparations for stockpiling medical supplies and creating a bacteriological service to meet an emergency. For both these tasks he was peculiarly fitted by his experience of laboratory work at Berlin and Hamburg. Besides these heavy official tasks he fulfilled many outside commitments. He was for a time lecturer on public health at St. Thomas's Hospital and an examiner for the Universities of London, Manchester, Birmingham, and Belfast. Many committees drew upon his experience, judgment, and common sense, and he was a member of the Army Hygiene Advisory Committee, the managing committee of the Bureau of Hygiene and Public Health

of the Colonial Office, of the board of studies in hygiene and public health of the University of London, and of the National Radium Commission.

In 1935, the year in which the University of Belfast conferred on him an honorary degree, he was appointed deputy to Sir Arthur MacNalty, who writes: "My appreciation of Carnwath's wide knowledge of public-health problems and of his sterling qualities only increased with the years. In the strenuous years of preparation preceding the second world war and in the early months of the war itself, his help was ever forthcoming, and I felt it greatly when ill health compelled him to retire early in 1940. He went back to Northern Ireland; but I met him occasionally at the Athenæum, and I was glad to know his health had improved and that he was helping Northern Ireland's work in public health as an elder statesman."

W. D.-C., who succeeded Carnwath at the Ministry, also pays tribute to his qualities: "Soon after I joined the Ministry of Health in 1927 I became Tom Carnwath's assistant, and his kindness, helpfulness, and good advice quickly made us the firm friends that we always remained. He had all the finest characteristics of the Northern Irish: quiet determination, cheerful acceptance of responsibility, and a hatred of humbug. His quiet almost casual manner cloaked a shrewd intellect, thoroughness in all he undertook, invariable consideration for others, and a keen sense of humour. He had the happy knack, so valuable to an administrator, of quickly seeing the most practical solution of any problem. His philosophical outlook enabled him to bear the disappointments of life with equanimity and to enjoy his retirement in his beloved County Antrim."

Dr. Carnwath married in 1908 Margaret M'Kee of Belfast, who survives him with two sons.

HENRY WILLIAM MARETT TIMS

O.B.E., M.A. Camb., M.D. Edin.

DURING the early years of the century Dr. Marett Tims was well known at many London colleges and medical schools as a teacher and examiner in anatomy and biology.

He was born in Calcutta, the son of Dr. T. Lamb Tims, and was educated at Reading School. After graduating at Edinburgh University in 1887 as M.B., with honours in almost every subject, he held demonstratorships in anatomy and physiology in Edinburgh before he came to England in 1889 to continue his postgraduate studies at St. Thomas's Hospital and the University of Cambridge. In 1890 he took his M.D. with commendation, and two years later he was appointed lecturer in biology and comparative anatomy at Westminster Hospital Medical School. Soon afterwards he was appointed reader in zoology at Bedford College for Women. About this time he became an examiner in physiology and biology for the Society of Apothecaries and in elementary biology for the Conjoint Board. He also held a demonstratorship in human morphology in the University of Cambridge, and in 1901 he took his B.A. (research) at King's College, Cambridge. In the same year he was appointed lecturer in comparative anatomy and biology at Charing Cross Hospital Medical School, and in 1908 he joined the staff of the Royal Veterinary College as professor of biology. During the 1914–18 war he left these multifarious duties to serve in the R.A.M.C. with the rank of lieut.-colonel. For his work in these years he was appointed O.B.E. in 1919, and in 1920 he was awarded the order of St. Sava of Yugoslavia.

As his career suggests, Dr. Tims's experience was varied and wide. He was a recorder and vice-president of section D of the British Association, and his papers to the association included one on the development, structure, and morphology of the scales in teleostean fishes. But no aspect of comparative anatomy held his interest so greatly as that of the teeth and their homologies, which had been his main preoccupation since the 'nineties when he had read papers before the Linnean Society on tooth genesis in the Canidæ and the Cavidæ. It was therefore appropriate that after the war he was appointed lecturer in comparative dental anatomy at the Royal Dental Hospital and was chosen as scientific editor of *Tomes's Dental Anatomy*. He was responsible for the 7th and 8th editions, and C. B. H., who shared in this task, writes: "Marett Tims entered with zest, and effectively, into the arguments about polyphyodontism and tooth-vestiges and the evolution of the forms of teeth. While rejecting Kukenthal's idea that molars represent the fusion of teeth belonging to two successive series, he expressed his opinion that fusion of two teeth anteroposteriorly in the same series may occur. He was absorbed in the evolution of dentition, and no other authority was in the same rich position to re-edit Tomes's manual, which was first published in 1876. No further edition has been published, and no new publication has supplanted his eighth edition which remains the standard work of reference in comparative dental anatomy."

In 1888 he married Alice Maud Mary, the daughter of Lieut.-Colonel Alexander Findlay, acting governor of Sierra Leone and the Gambia. Dr. Marett Tims survived her by four years and died on March 4, a few days before his 91st birthday. They leave a son and a daughter.

Diary of the Week

APRIL 18 TO 24

Tuesday, 20th

SOCIETY FOR THE STUDY OF ADDICTION

8 P.M. (11, Chandos Street, W.1.) Mr. Derek Curtis-Bennett, Q.C.: Alcoholism and the Law.

Wednesday, 21st

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1

5 P.M. *Section of Comparative Medicine.* Prof. L. P. Garrod: Effects of Antibiotics on Body Functions of Man and Animals. Prof. Alan Kekwick: Pharmacology of Some Commonly Used Antibiotics. Dr. W. S. Gordon, Mr. J. H. Taylor: Growth-Promoting Effect of Antibiotics—their Possible Modes of Action. Mr. S. K. Kon, D.SC.: Function of Antibiotics in Animal Nutrition.

8.15 P.M. *Section of General Practice.* Dr. Oliver Plowright, Dr. Wilfrid Sheldon, Mr. R. J. Cann: Tonsils and Adenoids.

Thursday, 22nd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2

5 P.M. Mr. D. J. Browne: Principle of Controlled Movement in Orthopædics. (Hunterian lecture.)

ROYAL SOCIETY OF MEDICINE

8 P.M. *Section of Urology.* Mr. F. G. Smiddy: Hyaluronidase and Urinary Stone. Mr. A. W. Badenoch, Mr. A. G. Dingley: Influence of Hyaluronidase on Renal Lithiasis. Mr. Basil Page, Mr. Ashton Miller, Mr. D. T. H. Paine: Vasotomy. Mr. D. St. Clair Henderson: Vesico-ureteral Reflex.

8.15 P.M. *Section of Obstetrics and Gynæcology.* Mr. C. M. Gwillim, Dr. H. J. Wallace, Dr. Magnus Haines: Leucoplakia and Allied Conditions.

CHADWICK LECTURE

5.30 P.M. (26, Portland Place, W.1.) Dr. C. Banning (Netherlands): Antenatal, Natal, and Postnatal Care in the Netherlands.

UNIVERSITY OF ST. ANDREWS

5 P.M. (Medical School, Small's Wynd, Dundee.) Mr. J. Bruce: Surgery of Small Intestine.

Friday, 23rd

OSLER CLUB OF LONDON

7.45 P.M. (11, Chandos Street, W.1.) Mrs. Marie Stopes, D.SC.: History of Contraception.

Appointments

BARNES, JOSEPHINE, D.M. Oxfd, M.R.C.P., F.R.C.S., F.R.C.O.G.: part-time asst. obstetrician and gynæcologist, Charing Cross Hospital, London.

BURNS, J. P. J., M.C., M.B. Belf., D.P.H.: senior asst. M.O., area No. 6, Middlesex.

DONELAN, M. J., M.B. N.U.I., D.P.H.: M.O., area No. 1 (Tredegar and Rhymney urban districts), Monmouthshire.

EDMONDSON, MARGARET M., M.B. Edin.: asst. M.O.H. and school M.O., Grimsby.

FOURACRE, A. J., M.R.C.S.: factory doctor, Withernsea, Yorks.

FOWLER, P. B. S., D.M. Oxfd, M.R.C.P.: part-time asst. physician, Charing Cross Hospital, London.

PICKLES, A. N., M.B. Leeds, D.P.H.: district M.O.H. and asst. county M.O., Kettering.

Liverpool Regional Hospital Board:

BRYSON, J. R., M.B. Glasg., F.F.A. R.C.S.: consultant anæsthetist, Clatterbridge General Hospital.

PRINSLEY, D. M., M.D. Durh.: senior R.M.O., Barrowmore Hospital.

THORP, EDITH M., M.B., B.SC. Manc., D.P.M.: whole-time asst. psychiatrist, Winwick Hospital.

South-Western Regional Hospital Board:

BRAMLEY, P. A., M.B., B.D.S. Birm., F.D.S. R.C.S.: consultant dental surgeon (part-time), Plymouth clinical area.

TROBRIDGE, G. F., M.B. Birm.: registrar in diseases of the chest, Hawkmoor Chest Hospital, Bovey Tracey, S. Devon.

TULLOCH, L. G., M.D. Aberd.: senior registrar in dermatology, Bristol clinical area.

Notes and News

WORLD HEALTH ORGANISATION

THE fifth year of W.H.O. is described by the Director-General, Dr. M. G. Candau,[1] as a period of "growth, adjustment, and consolidation" but also of "extremely serious and prolonged financial crises." The cut in the proposed United Nations Technical Assistance funds from an expected $9 million to an eventual $4·5 million resulted in curtailment or cancellation of many projects. Nevertheless, there were many substantial achievements. More than 330 health projects were helped in seventy-four countries; and 106 of these were completed during 1953. The campaign against communicable disease was extended; campaigns for control of malaria were carried on in twenty-one countries; 15 million persons were examined and 4 million treated for yaws and venereal diseases; and in twenty-four countries assistance was given for anti-tuberculosis measures. Health education has continued to be one of the major activities of W.H.O., in accordance with its consistent policy of helping underdeveloped countries to become self-supporting in medical services. 894 fellowships for study abroad were granted to health workers, in addition to those granted for local studies; the exchange of scientific information was encouraged by provision of teams of visiting medical experts, by regional or international medical conferences, and by supplying teachers or equipment to medical schools.

The World Health Day, on April 7, was this year devoted to the theme The Nurse, Pioneer of Health. Speaking in London on this occasion, Dr. Candau said that the basic aim of W.H.O. was to help countries to strengthen their national health services so that they might take the next feasible step forward in their development. It could be said, with some justice, that W.H.O. was, in the end, a self-liquidating organisation in that its task was to remove, in the largest possible measure, the need for its services. In the Western world the habit had become rather widespread of referring to certain countries as "underdeveloped." "There is always a danger in simplification; and the particular danger in this case is that it can lead to those feelings, and consequently expressions, of national superiority which can make international coöperative action well-nigh impossible. It is true that the Western communities are farther ahead along the road to national health and well-being than are, for instance, their brothers in Asia; but it is a chastening experience to consider just how short is the distance which divides them. . . . Everybody in this great city takes the existence of a supply of safe drinking-water for granted. Yet exactly one hundred years ago—that is, within the lifetime of the grandfathers of many now listening to me here—London possessed no general water-supply. One small section . . . was served by a pump which brought up water from a well in Broad Street . . . in 1854 this well, polluted by leakages from a neighbouring cesspool, brought death, in the form of cholera, to six hundred and sixteen people within the short space of two months."

Dr. Candau concluded by saying that the World Health Assembly next month would be asked to increase the effective working budget of the Organisation from the previous year's figure of $8½ million to $10,300,000. The United Kingdom was the second largest contributor, after the U.S.A.; and the proposed increase would raise the annual contribution per head of population in the United Kingdom from 1½*d.* to 2*d.*

HUNTERIAN INFLUENCE IN EXETER

AT a meeting of the Devon and Exeter Medico-Chirurgical Society on March 18, Mr. Norman Capener, the president, spoke of the Hunterian Influence in Exeter, relating his talk particularly to the medical school which flourished there during the first half of the 19th century. The school failed to survive the Medical Act of 1858, but while it lasted it included among its teachers outstanding figures, many of whose portraits are displayed in the board room of the Royal Devon and Exeter Hospital. As a background to the Hunterian tradition, the President discussed the influence of Cullen, Cheseldon, and Pott, and the impact of the Hunters upon their pupils, and their pupils' pupils. Nurtured in the Hunterian tradition was John Haddy James, a favourite pupil of John Abernethy. He was born in Exeter and with Samuel Barnes, another Exeter Barts man, he was a leader in the development of the Exeter school of medicine. He joined the staff of the Devon and Exeter Hospital after serving with Wellington at Waterloo, and two years later won the Jacksonian prize for an essay on inflammation. He invented many interesting mechanical devices and is noteworthy for having introduced continuous traction in the treatment of fractures. He was one of those who assisted Charles Hastings, of Worcester, in the foundation of the Provincial Surgical and Medical Association which later became the British Medical Association. James became its president in 1842, and the next year was one of the original fellows of the Royal College of Surgeons of England under its new charter. By 1854 the medical school had a close liaison with the Royal College of Surgeons. It had its museum, lecture-room, dissecting room, and laboratory and a magnificent library.

1. The Work of W.H.O., 1953: Annual Report of the Director-General. H.M. Stationery Office, 1954. Pp. 190. 10s.

A HOME FOR BACKWARD CHILDREN

St. Christopher's Trust, formed by the parents of mentally handicapped children in 1951, has opened a home at Glossop in Derbyshire. The house, which is called Redcourt, is a large one, with extensive grounds; and though at present there are only six children (aged 8–14), it will be able to take about fifty receiving residential training. The trust is running Redcourt unaided for 12 months, after which time it should be eligible for grants from local authorities.

N.H.S. AMBULANCE SERVICES

THE demands on these services continue to rise[1] and a recent memorandum (H.M.(54)33) from the Ministry of Health announces that local health authorities and hospitals are being asked to coöperate in local surveys to be undertaken by an ambulance adviser and a medical officer for the Ministry. Ways of securing better coördination and more economy in the use of ambulances are to be sought.

The Minister suggests that local authorities, when replacing vehicles, should bear in mind the advantages of ambulances for sitting patients which will accommodate a stretcher case if need be. They should also remember that travel by rail is not only cheaper but often more suitable for both types of case, and that stretchers suitable for transfer direct from ambulance to train are now available. Greater operational efficiency and economy in use of vehicles and staff is usually possible if all calls for ambulances go through ambulance control stations, especially where there is radio communication between these and individual ambulances. The duplication of ambulance services and inequalities between charges of various ambulance authorities should be reduced by closer coördination between them.

ALUMINIUM HOSPITAL BUILDINGS

AT the British Industries Fair to be held at Earls Court, London, from May 3 to 14, the Bristol Aeroplane Company (Weston) Ltd. are showing a 'Bristol' permanent aluminium hospital building. This consists of a reception lounge 24 ft. square by 9 ft. high flanked by a complete operating-suite 48 ft. long, 32 ft. wide, and 12 ft. high, comprising a theatre and four ancillary rooms. The company has already built over twenty hospitals and nurses' homes in Australia, including the largest prefabricated hospital in the world, the Manly District Hospital, Sydney. The advantages claimed for this method of unit construction include speed of erection, saving in site labour and designing time, dry construction, and easier installation of services.

STANDARD FOR TRANSFUSION EQUIPMENT

THE new British Standard for transfusion equipment (B.S. 2463: 1954) has been prepared to cover the requirements of the National Blood Transfusion Service and the Armed Services. The design of the bottle is that of the M.R.C. bottle, but without the "waist," which, though useful in providing a firm grip, has proved undesirable during freeze-drying operations. Attention has been paid to the need for interchangeability with similar equipment in other countries. Certain essential dimensions, such as those of the neck of the bottle, of rubber tubing, and of olive mounts, have been arrived at, and cognisance has been taken of discussions at a meeting of the transfusion equipment technical committee of the International Organisation for Standardisation held in London in 1952. In certain items—namely, the drip-counter, the filter-chamber, and the rubber closure—the design has not been specified but performance requirements are given instead. Only tubing made from natural rubber has been

1. See *Lancet*, 1953, i, 1316.

included in the standard since it is considered premature to include plastic tubing in the specification at this stage. Copies of this standard (3*s*. each) may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1.

OPERATION ON CONJOINED TWINS

The Conjoined Twins of Kano (16 mm., sound, colour, 40 minutes) is a film record of the operation at Hammersmith, at the end of last year, to divide conjoined twins. A brief history of the birth of the twins is followed by details of the examination of them, with special reference to the linking bridge and the structures it may contain. In this sequence there is a methodical development of thought from the examination by inspection and palpation to the more complex investigations by radiography and radioactive-isotope circulation tests, including a summary of the calculations by which the circulatory interchange between the twins was estimated. The operation itself is shown in great detail, including the instruments; skin preparation, anæsthesia, and intubation of the two infants; incision; operative technique; and precautions taken. Intelligent camera-work and skilful editing make clear every feature. The film ends with shots of the surviving child with his mother and of the necropsy specimen from the other. The bulk of the exposition is carried by the commentary, expertly delivered by Alvar Liddell, while the picture illustrates and often supplements what is said. The production, by Stanley Schofield, is of high standard. The medical adviser was Prof. Ian Aird.[1]

University of London

Dr. F. E. Camps, lecturer at the London Hospital Medical College, has been appointed to the part-time university readership in forensic medicine at the college.

Mr. G. E. Francis, PH.D., senior lecturer at St. Bartholomew's Hospital Medical College, has been appointed to the university readership in biochemistry at the college.

University of Leeds

Dr. Alfred Blalock, surgeon in chief to the Johns Hopkins Hospital, Baltimore, will deliver the Moynihan lecture at the University Union on Friday, May 14, at 3.30 P.M. He has chosen as his subject the Expanding Scope of Cardiovascular Surgery.

University of Edinburgh

On May 5 Prof. H. K. Beecher (Harvard Medical School) will deliver a Macarthur postgraduate lecture on Resuscitation and Other Early Care of the Severely Wounded Man. On May 6 Prof. Gerhard Domagk, director of the research laboratories for pathology and bacteriology of Farbenfabriken Bayer, is to give a Cameron lecture on Chemotherapy in Tuberculosis. On May 11 Dr. Evart A. Graham, chairman of board of regents, American College of Surgeons, is to deliver the second Sir John Fraser lecture on Cancer of the Lung. All these lectures will be held at 5 P.M. at the University New Buildings, Teviot Row.

Royal Society

Sir Howard Florey, F.R.S., will deliver the Croonian lecture on Thursday, May 27, at the society's rooms, Burlington House, Piccadilly, London, W.1, at 4.30 P.M. He will speak on Mucins and the Protection of the Body.

Society of Medical Officers of Health

Dr. Frederick Hall has become part-time medical secretary of this society. Mr. G. L. C. Elliston has given up his post as secretary to give all his time to the editorship of *Public Health* and the *Medical Officer*.

Naval Medical Compassionate Fund

A meeting of the subscribers of this fund will be held at 2.30 P.M. on April 30 at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1, to elect six directors.

St. John Ambulance Brigade

A conference for surgeons, nursing officers, and non-medical officers of the brigade is to be held at the Cairn Hotel, Harrogate, from Friday to Sunday, April 23 to 25. The speakers will include: Major A. C. White Knox, the surgeon-in-chief, Dr. A. D. D. Broughton, M.P., Prof. Cyril Polson, and Dr. C. C. Boley.

1. See Aird, I. *Brit. med. J.* April 10, 1954, p. 831.

Royal College of Surgeons of England

At a meeting of the council held on April 8 the honorary fellowship was conferred on Dr. G. Gavin Miller of Montreal. The following were elected to the fellowship without examination as medical practitioners of at least 20 years' standing: Mr. J. W. H. Grice (Tunbridge Wells), Mr. D. M. E. Thomas (Sully, Glam.), Prof. G. Hadfield (London), Prof. J. Trueta (Oxford), and Mrs. D. R. Campbell (Coventry). Mr. W. A. Jackman (Bristol) and Mr. R. R. Simpson (Hull) were admitted to the fellowship ad eundem. Dr. W. D. M. Paton (University College Hospital Medical School) was admitted as the first professor of pharmacology.

The Jacksonian prize for 1953 was awarded to Mr. J. H. Peacock. The first Mitchiner medal was awarded to Brevet Colonel H. D. Chalke, and the first Lady Cade medal to Squadron-Leader R. R. L. Pryer. Prof. Martin A. Rushton (Guy's) was awarded the John Tomes prize. A Hunterian lectureship was awarded to Prof. Milroy A. Paul (Ceylon). The council selected Diaphragmatic Hernia as the subject for the Jacksonian prize for 1955.

Diplomas were granted jointly with the Royal College of Physicians to the following:

D.C.H.—Deirdre M. Airey, Enid Atkins, Herman Aufrichtig, Doris M. Beaton, Elaine M. Belton, Elizabeth F. Bennett, Jagri Ram Bhatia, Flora M. Bisset-Smith, Audrey M. Bolton, E. M. Broadfoot, J. A. Browne, D. W. Bull, June M. Burger, A. P. Camilleri, Kai Hang Chau, J. A. Cheese, Omana Amma Cheriyan, Emanuel Chigier, J. H. Clyde, G. J. Cousins, Mary Crawford, Joan M. St. V. Dawkins, Sooba Rama Deenadayalu, J. M. Doyle, Catherine M. Durkin, J. G. Edgar, C. P. E. Elliott-Binns, J. W. Fisk, D. M. Fraser, Shiba Prasad Ghosal, Sheila M. Gough, Margaret L. Gladstone, Isobel H. Grant, Sripal Tilak Gunewardene, Ann M. Haines, Margaret E. Hall, Mary Hallowell, M. J. T. Hewetson, Sai Kong Ho, Kathleen A. Hockey, K. S. Holt, Megan D. M. Johnson, Jocelyn Johnston, Premlal Kapur, Pathmaranie Kathiravelu, R. E. Kottler, Sylvia Lath, J. B. Lewis, Melvin Lewis, Siew Whye Loh, G. C. Love, Margaret Luing, M. F. McDowall, Thomas McKendrick, Sheila L. McKinlay, Sohan Singh Manchanda, Cicely J. Millbank, Rhona E. Morgan, Marion E. Morris, Marion B. Morton, Chitra Mukherjee, B. K. A. Muller, N. V. O'Donohoe, R. M. Oliver, Ida S. Paranjoti, Hawa Patel, G. N. St. J. Penney, Jean Poole, Frances E. Powell, Edith I. Proctor, S. D. Roche, Sonia Rollin, Carol J. Rubidge, H. H. Shawdon, Isabel G. Smith, M. H. Southall, Joyce K. Starkie, Joan V. Stavert, Kenneth Stewart, Mary Sugden, Majuree Sundaravej, C. G. W. Sykes, I. G. Thomson, J. N. Ure, Denorah Vardy, Claudine M. R. Vesey, I. S. Wallman, Ruth M. Walters, Mogamat Arashat Warley, S. M. D. G. R. Wijegunaratne, P. S. W. Wilkins.

D.Phys. Med.—D. J. E. Cheshire, P. R. Travers.

D.O.—J. A. Akingbehin, M. R. Ashbridge, Mohamed Hassan Ashruff, D. J. Bowerman, George Davidson, Mohammad Siddiq Faridi, K. C. Garg, Harry Hardy, B. A. E. Harley, Sukhalal Udhoji Joshi, Akil bin Abdul Kadir, R. C. K. Loh, Marguerite C. Macdonald, Laurel J. MacIntosh, Mazharul Haque Malik, D. L. E. Paine, R. A. Quesada-Guardia, J. N. Rohatgi, Satyasinha Roy, G. S. Sandhu, Gurbakhsh Singh, K. S. Subramaniam, A. A. Tye, J. H. W. Wessels.

D.T.M. & H.—J. C. Aickin, F. L. Ashworth, A. S. Beare, Chanindhara Bhamarasuta, N. K. Bharucha, Z. M. A. Cader, A. T. Cook, T. M. Desai, J. K. Gajjar, G. H. K. Gentle, J. E. J. Hurman, Samrit Jatinandana, A. C. Kail, Ahmad Mohammed Khatib, Y. J. Kiladjian, A. G. Leishman, W. S. Millar, H. R. Miller, K. P. Milne, Adam Muir, I. G. Murray, Leslie No Onha, Magdelen K. E. Oberhoffer, Mohan Kumar Panikkar, Kanu Hirabhai Patel, H. N. Ray, Werner Rollinghoff, P. D. Scheffel, E. K. Tagboto, Paul Yates, Ponniah Yoganathan.

British Association

This year the annual meeting of this association will be held at Oxford, from Sept. 1 to 8, under the presidency of Dr. E. D. Adrian, O.M., F.R.S.

Hunterian Society

The gold medal of this society for 1953 has been awarded to Dr. J. Lipsey (Littlehampton), and a proxime accessit award has been made to Dr. B. C. Zoob (Battersea).

The subject for the 1954 essay is Management of the Climacteric in General Practice. Further details may be had from the hon. secretary, Mr. Alec A. Badenoch, 110, Harley Street, London, W.1.

International Union of the Medical Press

The second congress of the union is to be held in Turin on May 30. The speakers will include Dr. H. Fiessinger (*Le Monde*), Dr. J. Lederer (*Association Presse Médicale Belge*), Dr. J. J. Gillon (*Concours Médical*), Dr. H. A. Clegg and Dr. J. W. P. Thompson (*British Medical Journal*), and Dr. G. C. Angela (*Minerva Medica*). Further particulars can be had from the Secretary of the Congress, Dr. F. Gavosto, Corso Bramante 83, Turin, Italy.

CORRIGENDUM: *Abnormal Nerve Impulses.*—In this leading article (March 27, 1954, p. 660) footnote 6 should read: "Lepeschkin, E. *Amer. J. Med.* 1954, **16**, 73."

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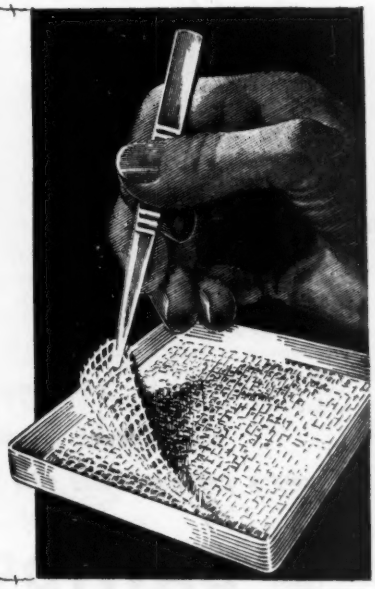

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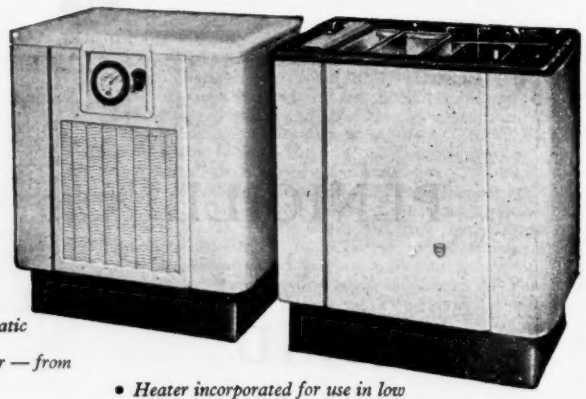

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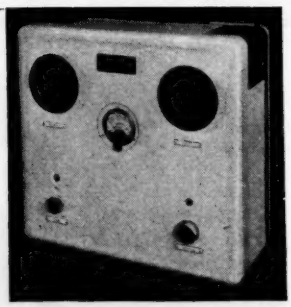

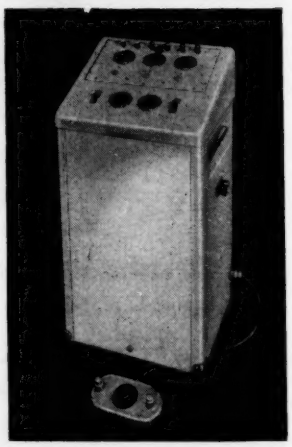

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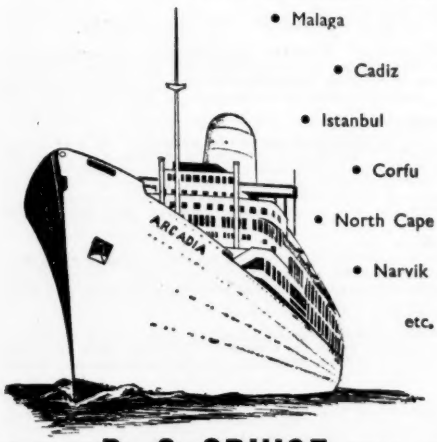

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Occupational therapy is a special feature of the Hospital and there are excellent facilities for indoor and outdoor recreation—tennis, cricket, croquet, badminton, billiards, cinema, television, etc. Geriatric units for mild cases of senility are provided where patients can pursue as normal a life as possible.

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Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

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The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

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Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 34

ANÆSTHETICS

St. Nicholas, S.E.18. Sr. H.O. .. 37
Aberdeen Gen. Hosps. B.O.M. Sr. H.O. .. 38
Bath Clinical Area. Reg. .. 39
Colchester Group H.M.C. Sr. H.O. .. 40
East Anglian R.H.B. Sr. H.M.O. .. 34
Leamington Spa. Warneford Gen. H.O. .. 41
Leeds R.H.B. Reg. .. 42
Maidstone. Mid-Kent H.M.C. Sr. H.O. .. 42
North East Met. R.H.B. Reg. .. 37
North West Met. R.H.B. Cons. .. 35
Northwood, Middx. Mount Vernon. Reg. .. 43
Norwich. Norfolk & Norwich. Sr. H.O. .. 43
Plymouth Clinical Area. Reg. .. 43
Scotland. South-Eastern R.H.B. Sr. H.M.O. .. 35
Sheffield City Gen. Sr. H.O. .. 44
Sheffield R.H.B. Locum Sr. H.M.O. or Cons. & Locum Sr. H.M.O.'s .. 35
Slough. Upton. Reg. .. 44
South West Met. R.H.B. Cons. .. 35
Stafford H.M.C. Sr. H.O. .. 45
Stoke-on-Trent, North Staffs Royal Infy. Sr. H.O. .. 45
Swansea. Morriston. Sr. H.O. .. 46
Warrington Infy. Sr. H.O. .. 46
New Zealand. Otago Hosp. Board. Jr. Specialist .. 36

CASUALTY

Acton, W.3. Sr. H.O. .. 36
Battersea Gen., S.W.11. H.O. or Sr. H.O. .. 36
Hackney, E.9. H.O.'s .. 36
Hammersmith, West London & St. Mark's, W.12. Sr. H.O. .. 36
Prince of Wales's Gen., N.15. Sr. H.O. 37
Royal Free, W.C.1. Sr. H.O. .. 37
Ashford, Kent. H.O. .. 38
Brighton. Royal Sussex County. Jr. H.M.O. .. 39
Bury St. Edmunds. West Suffolk Gen. Sr. H.O. .. 40
Colchester Group H.M.C. Sr. H.O. .. 40
Halifax. Royal Infy. Sr. H.O. .. 41
Hemel Hempstead. West Herts. Jr. H.M.O. .. 41
Hitchin Hosps. H.O. .. 41
Leeds. Public Dispensary & Hosp. Sr. H.O. .. 41
Maidstone. West Kent Gen. Sr. H.O. 42
Newport, Mon. Royal Gwent. Sr. H.O. 43
Nottingham Gen. Sr. H.O. .. 43
Oxford R.H.B. Sr. H.M.O. .. 35
Plymouth Clinical Area. Sr. Casualty Officer .. 35
Romford, Oldchurch. Sr. H.O. .. 44
Salisbury Gen. Sr. H.O. .. 44
Slough. Upton. Locum Sr. H.O. .. 44
Slough. Upton. Sr. H.O. .. 44
Southend Gen. Sr. H.O. .. 45
Wolverhampton H.M.C. H.O. .. 47
York A & Tadcaster H.M.C. Jr. H.M.O.'s .. 47

CHEST AND TUBERCULOSIS

Colindale, N.W.9. Locum Sr. H.M.O. 34
Plaistow, E.13. Sr. H.O. .. 37
Alton. Henry Gauvain. Sr. H.O. .. 38
Birmingham R.H.B. Sr. H.M.O. .. 34
Bristol. Cossham/Frenchay H.M.C. H.O. .. 40
Colchester Group H.M.C. Sr. H.O. .. 40
Derby. Derwent. Reg. .. 40
Henley-on-Thames. Peppard Chest. Jr. H.M.O. .. 41
Leeds R.H.B. P.-t. Cons. .. 35
Leeds R.H.B. Reg. .. 42
Manchester R.H.B. Sr. H.M.O. .. 35
North East Met. R.H.B. Reg. .. 37
Sheffield R.H.B. Locum Reg. .. 45
Sheffield R.H.B. Sr. H.M.O. .. 36
Ventnor, I.W. Royal Nat. Hosp. for Diseases of the Chest. Jr. H.M.O. & Sr. H.O. .. 46
Wakefield. Pinderfields Gen. Sr. H.O. or Locum Sr. H.O. .. 46
York A & Tadcaster H.M.C. Sr. H.O. 47
Castlerea. St. Patrick's Reg. Chest. Temp. Reg. .. 47
Newfoundland Provincial Dept. of Health. Asst. Supt., Sr. & Jr. Physicians & Sr. Clin. Tuberculosis Officer .. 36

DENTAL SURGERY
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Sr. H.O. 38

EAR, NOSE, AND THROAT
North East Met. R.H.B. Reg. .. 37
Bath Clinical Area. Cons. .. 34
Birmingham & Midland E. & T. Pre-reg. H.O. 39
Birmingham R.H.B. Reg. 39
East Cumberland H.M.C. H.O. .. 40
Inverness Hosps. B.O.M. H.O. .. 41
Leamington Spa. Warneford Gen. H.O. 41
Maidstone. Kent County Ophthalmic & Aural. Sr. H.O. 42
Salisbury Gen. Sr. H.O. 44
Southampton. Royal South Hants & Gen. Sr. H.O. 45
Welsh R.H.B. Locum Cons. 36
Wolverhampton H.M.C. H.O. .. 47

GERIATRICS
Leeds. Sr. James's. Sr. H.O. 42
Wellingborough. Park. Sr. H.O. .. 46

INFECTIOUS DISEASES
Neasden, N.W.10. Reg. 37
Royal Free, W.C.1. H.O. 37
Leeds R.H.B. Reg. 42
Portsmouth Group H.M.C. Sr. H.O. 44
Stoke-on-Trent. Bucknall Isolation. Sr. H.O. 46

LARYNGOLOGY AND OTOLOGY
Liverpool United Hosps. Temp. Sr. H.O.'s 42

MEDICINE
Hammersmith, West London & St. Mark's, W.12. H.O.'s 36
North East Met. R.H.B. Regs. .. 37
North Middlesex, N.18. H.O.'s .. 36
South London Hosp. for Women & Child., S.W.4. Sr. H.O. 37
South Western, S.W.9. Reg. .. 37
St. Mary's, W.2. Regs. 37
Whittington, N.19. Reg. 38
Alton Gen. Sr. H.O. 38
Bath Clinical Area. P.-t. Clin. Assts. (G.P.) 39
Birmingham R.H.B. Reg. 39
Bolton & Dist. H.M.C. Sr. H.O. .. 38
Bournemouth. Christchurch. Reg. .. 38
Bournemouth. Royal Vic. H.O.'s .. 38
Chertsey. St. Peter's. Sr. Reg. .. 40
Enfield. Chase Farm. H.O. 40
Exeter. Royal Devon & Exeter. H.O. 40
Hillingdon. Middx. Reg. 41
Leeds. St. James's. Sr. H.O. 42
Leeds United Hosps. Sr. H.O. .. 41
Lincoln. County. Sr. H.O. 42
Liverpool United Hosps. P.-t. Cons. .. 35
Newark Gen. Sr. H.O. 43
North Gloucestershire Clinical Area. Reg. 43
Poole Gen. Reg. 43
Scotland. Eastern R.H.B. Reg. .. 44
Scotland. Northern R.H.B. Sr. H.O. 44
Sheffield United Hosps. Sr. H.O. .. 44
South East Met. R.H.B. P.-t. Cons. .. 35
Swansea. Mount Pleasant. Jr. H.M.O. 46
Tredegar. St. James. H.O. 46
Windsor. King Edward VII. H.O. 47
Wolverhampton H.M.C. H.O. .. 47
Northern Ireland Hosps. Auth. Cons. 36

NEUROSURGERY
Bristol Clinical Area. Sr. Reg. .. 39
Swansea. Morriston. H.O. 46

OBSTETRICS AND GYNÆCOLOGY
Bearsted Mem. (Jewish Maternity). H.O.'s 36
Hosp. for Women, W.1. Sr. H.O .. 36
Prince of Wales's Gen., N.15. H.O. 37
Royal Northern, N.7. Sr. H.O. .. 37
South London Hosp. for Women & Child., S.W.4. H.O. 38
Ashford, Kent. Willesborough. H.O. 38
Enfield. Chase Farm. H.O. 41
Halifax Gen. Sr. H.O. & H.O. .. 41
Hitchin. North Herts Hosp. Sr. H.O. 41
Leeds R.H.B. Reg. 42
North Shields. Preston Hosp. Sr. H.O. 43
Nottingham. Highbury. Sr. H.O. .. 43
Romford. Oldchurch. Sr. H.O. .. 44
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 46
Swansea. Mount Pleasant. Sr. H.O. 46
Swansea. Sr. H.O. 46

OPHTHALMOLOGY
Guy's, S.E.1. P.-t. Cons. 34
Brighton. Sussex Eye. H.O. 39
Liverpool United Hosps. Temp. Sr. H.O. 42
Nottingham & Midland Eye Infy. Sr. H.O. 43
Portsmouth Group H.M.C. Reg. .. 44
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 45

ORTHOPÆDICS
Whittington, N.19. Locum Reg. .. 38
Alton. Treloar Orthopædic. Reg. .. 38
Bristol Clinical Area. P.-t. Clin. Asst. (G.P.) 39
Chertsey. St. Peter's. Sr. H.O. .. 40
Colchester Group H.M.C. H.O. .. 40
Durham. County. Pre-reg. H.O. .. 40
East Cumberland H.M.C. Sr. H.O. .. 40
Glasgow Royal Infy. Sr. H.O. .. 41
Grimsby Gen. Sr. H.O. or Locum Sr. H.O. 41
Ipswich Borough Gen. Sr. H.O. .. 41
Ipswich. East Suffolk & Ipswich. H.O. 41
Leeds R.H.B. Regs. 42
Leeds United Hosps. Sr. H.O. .. 41
Mansfield & Dist. Gen. Reg. 42
Newport, Mon. Royal Gwent. Sr. H.O. 43
Plymouth Clinical Area. Cons. .. 35
Portsmouth Group H.M.C. Sr. H.O. 44
Sheffield R.H.B. Locum Regs. .. 45
Shrewsbury. Royal Salop Infy. Sr. H.O. 45
Southampton. Royal South Hants. Sr. H.O. & H.O. 45
Stanmore, Middx. Royal Nat. Orthopædic. Sr. H.O. 46
West Cornwall Clinical Area. Reg. .. 46
Winchester. Royal Hants County. Sr. H.O. 47
Wolverhampton H.M.C. Sr. H.O. or H.O. 47

PÆDIATRICS
Hammersmith, West London & St. Mark's, W.12. H.O. 36
King's College, S.E.5. Reg. 37
North East Met. R.H.B. Reg. .. 37
Royal Free, W.C.1. H.O. 37
Westminster Child's., S.W.1. Pre-reg. H.O.'s 38
Aberdeen City. Sr. H.O. 38
Ashton, Hyde & Glossop H.M.C. H.O. or Sr. H.O 38
Bath Clinical Area. P.-t. Clin. Asst. (G.P.) 39
Bradford Child's. H.O. 39
Leeds R.H.B. Reg. 42
St. Albans City. H.O. 45
Wirral. Leasowe Child's. Sr. H.O. .. 47
Wolverhampton Group of Hosps. Sr. Reg. 46

PATHOLOGY
South East Met. R.H.B. Sr. H.M.O. .. 34
St. George's, S.W.1. Sr. H.O. 37
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Sr. H.O. 38
Birmingham United Hosps. Sr. H.O. 39
Bournemouth. Royal Victoria. Sr. H.O. 38
Lancaster. Royal Lancaster Infy. Sr. H.O. 42
Manchester R.H.B. Sr. H.M.O.'s .. 35
Manchester United Hosps. Sr. H.O.'s 42
North East Met. R.H.B. Reg. .. 37
North West Met. R.H.B. Cons. .. 35
Sheffield. City Gen. Sr. H.O. 45

PSYCHIATRY
Guy's. York Clinic, S.E.1. Sr. H.O. .. 36
North West Met. R.H.B. P.-t. Reg. 37
Westminster, S.W.1. Sr. H.M.O. .. 34
Blackburn. Calderstones. Jr. H.M.O. 39
Bristol. Barrow Hosp. Sr. H.O. .. 39
Chesterfield H.M.C. Jr. H.M.O. .. 40
Derby. Pastures. Reg. 40
Glasgow. Stobhill Gen. H.O.'s .. 41
Leeds R.H.B. Regs. 42
Leicester. Carlton Hayes Mental. Locum Jr. H.M.O. 42
Manchester. Prestwich (Mental). Jr. H.M.O. 42
Manchester R.H.B. Sr. Reg. 42
Newcastle R.H.B. Locum Reg. .. 43
North East Met. R.H.B. Regs. .. 37
Oxford. Warneford & Park Hosps. Sr. H.O. 43
Richmond, Surrey. Cassel Hosp. for Functional Nervous Disorders. Sr. Reg. 44
Scotland. North-Eastern R.H.B. Sr. Reg. 44
Scotland. Northern R.H.B. Reg. .. 44
Scotland. Western R.H.B. Sr. H.O.'s 44
Sheffield. Middlewood. Jr. H.M.O. or Sr. H.O. 44
Sheffield R.H.B. Locum Sr. H.M.O. .. 35
Sheffield R.H.B. Sr. H.M.O. 36
South East Met. R.H.B. Sr. H.M.O. .. 35
Walsall, West Bromwich & Birmingham (Mental) Groups of Hosps. Cons. 36
York. The Retreat. Locum 47

RADIOLOGY
Central Middlesex, N.W.10. Reg. .. 36
Birmingham R.H.B. Reg. 39
Chertsey. St. Peter's. Reg. 40
Croydon Group H.M.C. Reg. .. 40
Sheffield R.H.B. Locum Sr. Reg. .. 45
Southend-on-Sea H.M.C. Temp. Sr. H.M.O. 35
Welsh R.H.B. Locum Cons. 36

RADIOTHERAPY
Sheffield Nat. Centre for Radiotherapy. Reg. 45

RHEUMATOLOGY
Sheffield United Hosps. Reg. 44

SURGERY
Charing Cross, W.C.2. Locum Sr. Reg. 36
London, E.1. Reg. 36
Prince of Wales's Gen., N.15. Sr. H.O.'s & H.O. 37
Royal London Homœopathic, W.C.1. H.O. 37
Royal Northern, N.7. H.O. 37
Aberystwyth Gen. Pre-reg. H.O. .. 38
Ashford, Kent. Sr. H.O. 38
Ashford, Kent. Willesborough. H.O. 38
Ashton, Hyde & Glossop H.M.C. Sr. H.O. 38
Barnsley. Beckett. Reg. 39
Barnstaple. North Devon Infy. Sr. H.O. 39
Birmingham. Dudley Road. H.O. .. 39
Birmingham R.H.B. Regs. 39
Bradford Royal Infy. Sr. H.O. .. 39
Bristol. Southmead Gen. Hosp. Group M.C. Sr. H.O. 40
Bury & Rossendale H.M.C. Sr. H.O. 40
Caerphilly. Sr. H.O. & H.O.'s .. 40
Chester-le-Street. Gen. Pre-reg. H.O. 40
Dewsbury. Staincliffe Gen. H.O. .. 40
Dewsbury. Staincliffe Gen. Sr. H.O. 40
Dovercourt Harwich & Dist. Sr. H.O. 40
Edgware Gen. H.O.'s 40
Epping. St. Margaret's. Sr. H.O. & Pre-reg. H.O. 40
Epsom Dist. H.O. 40
Grimsby Gen. Reg. 41
Halifax Royal Infy. Sr. H.O. & H.O. 41
Hereford Gen. H.O. 41
Hounslow, Middx. Locum Reg. .. 41
Huddersfield Royal Infy. H.O.'s .. 41
Inverness Hosps. B.O.M. H.O. .. 41
Kendal. Westmorland County. Sr. H.O. 41
Leeds R.H.B. Reg. 42
Lincoln. County. H.O. 42
Liverpool United Hosps. P.-t. Cons. .. 35
Manchester. Altrincham Gen. Sr. H.O. 42
Newbury Dist. Sr. H.O. 43
Newport, Mon. Royal Gwent. Sr. H.O. 43
North East Met. R.H.B. Reg. .. 37
Nottingham Gen. H.O. 43
Peterborough Mem. Reg. 43
Plymouth Clinical Area. Regs. .. 43
Plymouth. South Devon & East Cornwall. H.O. 44
Pontypool & Dist. Jr. H.M.O. .. 43
Poole Gen. Pre-reg. H.O.'s 43
Portsmouth Group H.M.C. Sr. H.O. 44
Salisbury Gen. Reg. 44
Sheffield R.H.B. Locum Regs. .. 45
Shrewsbury. Royal Salop Infy. H.O. 45
Southampton. Royal South Hants. H.O. 45
Southend Gen. H.O. 45
Stoke-on-Trent. City Gen. Sr. H.O.'s & Pre-reg. H.O.'s 45
Stoke-on-Trent. North Staffs Royal Infy. H.O. 45
St. Helens. Sr. H.O. 45
Taplow. Canadian Red Cross Mem. H.O. 46
Tredegar Gen. Sr. H.O. & H.O. .. 46
Tunstall. Burslem, Haywood & Tunstall War Mem. Sr. H.O. .. 46
Warrington Gen. H.O. 46
West Cornwall Clinical Area. Reg. .. 46
Weston-super-Mare Gen. H.O. .. 47
Winchester. Royal Hants County. H.O. 47
Windsor. King Edward VII. H.O. .. 47
Wolverhampton H.M.C. H.O. .. 47
Wrexham. Maelor Gen. H.O. 46
York A & Tadcaster H.M.C. Sr. H.O. 47

UROLOGY
Hastings & St. Leonards. Buchanan. Sr. H.O. 41
Leeds United Hosps. Sr. H.O. .. 42

GENERAL
New York. New Rochelle. Internes 47

PUBLIC APPOINTMENTS 47

GENERAL PRACTICE 48

MISCELLANEOUS 48

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

CHARLES MURCHISON SCHOLARSHIP IN CLINICAL MEDICINE

The next Examination for the Scholarship will be held at Guy's Hospital, London, S.E.1, on MONDAY, 21ST JUNE, 1954.

The Examination is open to any student of medicine, whether holding a medical qualification or not, who, subsequently to the date of passing his professional Examination in Anatomy and Physiology for a medical qualification, commenced clinical studies not less than 2½ and not more than 5 years previously at a medical school in London, recognised by the Royal College of Physicians, or at the University of Edinburgh, including medical classes recognised by the Medical Faculty of the University.

The Scholarship is of the value of 20 guineas and is tenable for 1 year.

Intending candidates are required to send their names to the Registrar of the Royal College of Physicians, 12, Pall Mall East, London, S.W.1, not later than Monday, 31st May, with evidence of the duration of their medical studies from the Deans of their respective Schools and evidence of the date at which they passed their Examination in Anatomy and Physiology.

HAROLD BOLDERO, D.M., Registrar.

12, Pall Mall East, London, S.W.1.

INSTITUTE OF DISEASES OF THE CHEST

REFRESHER COURSES, 1954

Refresher courses in diseases of the chest, including tuberculosis, will be held at the Brompton Hospital from 19TH to 23RD JULY and at the London Chest Hospital from 20TH to 24TH SEPTEMBER, 1954. These courses are intended for Physicians of Consultant and Senior Hospital Medical Officer grade either in chest disease or in general medicine, to whom they are open without fee.

Further information, including a detailed programme, may be obtained on application to the Dean, Institute of Diseases of the Chest, Brompton, S.W.3.

POSTGRADUATE MEDICAL SCHOOL AND HAMMERSMITH HOSPITAL. CONSULTANT PHYSICIAN interested in the rehabilitation of the elderly sick to take charge of 15 beds in the Hospital and 21 Beds in St. Helena's Home, to advise and teach on geriatric questions, 2 sessions a week, honorarium £310–£500 p.a. according to seniority.

Applications should be sent to the Dean, Postgraduate Medical School, Ducane-road, London, W.12, by 1st May.

ST. MARY'S HOSPITAL MEDICAL SCHOOL (University OF LONDON), Paddington, W.2. Applications are invited for 3 POSTGRADUATE MEDICAL RESEARCH FELLOWSHIPS at the rate of £500 for 1 year, which may be held in any Pre-medical, Pre-clinical or Clinical Department of the Medical School. Applicants must be medically qualified and should have completed their National Service. The duties will consist of whole-time research under the Head of the Department concerned.

Applications (in duplicate), stating age, qualifications, experience, and a brief outline of the research work proposed, together with the names of 2 referees, should be received by the Secretary not later than 11th May, 1954.

THE WELSH NATIONAL SCHOOL OF MEDICINE. (UNIVERSITY OF WALES.) Applications are invited for the appointment of ASSISTANT CLINICAL PATHOLOGIST in the Department of Pathology and Bacteriology. Previous experience in pathology is not essential. The appointment is a full-time one for a period of 2 years within the salary scale £650–£100–£950 p.a., with participation in family allowance and superannuation schemes. The point of entry on the scale will depend on qualifications and experience. The person appointed will be required to commence duty as soon as possible.

Applications to the undersigned, from whom further particulars of the appointment may be obtained.

34, Newport-road, Cardiff. F. DODSWORTH, Secretary.

THE UNITED LEEDS HOSPITALS. Applications are invited for the appointment of a RESEARCH FELLOW to undertake work in connection with the use of Radioactive Isotopes, both for diagnosis and therapy. Candidates should possess a higher medical qualification and have some previous experience in the use of radio-isotopes. The appointment, with a minimum tenure of 3 years, will be on a salary scale of £1000–£100–£1300 p.a., the conditions of service being those laid down by the Medical and Dental Staffs Whitley Council.

Applications, giving full details of training and experience with relevant dates, age, nationality, &c., and accompanied by the names and addresses of 3 referees, should reach the undersigned by 1st May, 1954.

J. A. TUNSTALL, Secretary to the Board of Governors.

The General Infirmary, Leeds, 1.

THE UNIVERSITY OF LEEDS. Department of Chemical PATHOLOGY. Applications are invited for appointment as DEMONSTRATOR IN CHEMICAL PATHOLOGY on the salary scale (for medically qualified persons) of £600–£100–£800. The post involves duties in the Chemical Pathology Laboratories serving the General Infirmary at Leeds.

Applications (3 copies), stating date of birth, qualifications and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 3rd May, 1954.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a post of LECTURER IN BACTERIOLOGY AND VIRUS DISEASES, to begin duties as soon as possible. Salary scale £700–£1500, with F.S.S.U. provision and family allowance. Initial salary according to qualifications and experience.

Applications (6 copies) should reach the Registrar (from whom further particulars should be obtained) by 8th May, 1954.

THE UNIVERSITY OF LIVERPOOL. Department of OBSTETRICS AND GYNÆCOLOGY. Applications are invited for 2 posts of Whole-time OBSTETRIC TUTORS, resident in the Liverpool Maternity Hospital and Mill Road Infirmary respectively. Salary according to the University scales depending on qualifications and experience, but in any case not less than £600 p.a., with board-residence. The appointments will be for 1 year in the first instance, duties to commence on 1st October, 1954. Previous resident experience in obstetrics and gynæcology is essential and higher qualifications in these subjects is desirable.

Applications, which should include the names of 3 referees, should be received not later than Saturday, 15th May, 1954, by the undersigned, from whom further particulars may be obtained. STANLEY DUMBELL, Registrar.

Hospital Services : Senior Appointments

COLINDALE HOSPITAL, Colindale-avenue, London, N.W.9. Locum SENIOR HOSPITAL MEDICAL OFFICER (whole-time), resident or non-resident, required immediately for a period of 2–3 months at above Hospital, which has 240 Beds for treatment of pulmonary tuberculosis. Applicants must have previous experience in this specialty.

Apply immediately to Physician-Superintendent.

GUY'S HOSPITAL, S.E.1. The Board of Governors invites applications for the appointment of an OPHTHALMIC SURGEON (part-time) to Guy's Hospital and the Evelina Hospital for Sick Children. The present attendances are 3 sessions per week at Guy's Hospital and 1 session a fortnight at the Evelina Hospital for Sick Children. The appointment is of Consultant status and applicants are required to hold higher qualifications.

Applications (1 copy), together with the names of 3 referees, should be submitted to reach the Superintendent, Guy's Hospital, S.E.1, not later than 15th May, 1954. In accordance with Statutory Instrument No. 1259 of the National Health Service regulations, canvassing members of the Board or Advisory Appointments Committee will lead to disqualification.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time ASSISTANT CLINICAL PATHOLOGIST to the staff of the Lewisham Group of laboratories. The duties will be mainly at Dulwich Hospital, East Dulwich-grove, S.E.22, in the Camberwell Group of hospitals. An association between King's College Hospital Medical School and this Hospital exists for teaching purposes. Candidates must have had general experience in pathology and the possession of a higher qualification is desirable. Salary within the scale £1300–£50–£1750.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 1st May, 1954.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. CHIEF ASSISTANT (full-time) required in Department of Psychiatry (Senior Hospital Medical Officer grade). D.P.M., mental hospital experience and interest in psychotherapy essential. Terms and conditions of service of hospital medical and dental officers for the time being in operation apply. Canvassing of Members of Board or Advisory Appointments Committee will disqualify.

Applications (10 copies), with names of 3 referees, should reach me not later than 15th May.

R. I. G. BROOKS, Deputy House Governor and Secretary.

BATH CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of CONSULTANT E.N.T. SURGEON in the Bath Clinical Area which comprises Bath, North East Somerset, Mid and West Wilts. The appointment may be held either on a whole-time or maximal (9 sessions) part-time basis. Applicants should have had wide experience in E.N.T. surgery. The successful candidate will have charge of beds at the Royal United Hospital and at St. Martin's Hospital, Bath, and will be required to visit other hospitals in the Clinical Area as may be determined by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 8th May, 1954.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT CHEST PHYSICIAN (salary scale £1300–£1750 p.a.) to assist Consultants in Walsall and Burton-on-Trent areas. Duties include chest clinics in Walsall and inpatients at Goscote Hospital, Walsall (60 Beds), and Outwoods Hospital, Burton-on-Trent (73 Beds).

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 3rd May, 1954.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ASSISTANT ANÆSTHETIST (whole-time), Norfolk and Norwich Hospital Group. Duties will include approximately 2 sessions per week at Lowestoft and North Suffolk Hospital. Higher qualification and wide experience essential. Salary scale £1300–£1750.

Detailed applications (8 copies), including age, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 3rd May, 1954. Candidates invited to visit hospitals concerned by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital, Norwich.

LEEDS REGIONAL HOSPITAL BOARD. Part-time appointment (9 sessions per week) of CONSULTANT in Thoracic Surgery to the Regional Thoracic Surgical Service for duties initially in the Bradford area, where the Thoracic Units deal with both tuberculous and non-tuberculous diseases of the chest and cardiac surgery.

Applications (12 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 15th May, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) 2 whole-time, non-resident posts of ASSISTANT PATHOLOGIST in the Group Laboratories at (i) Blackburn Royal Infirmary, (ii) Hope Hospital, Salford. Successful candidates will work under general guidance of a Consultant, and facilities for gaining experience in all branches of pathology are available. Candidates for both posts to state preference. 3rd May, 1954.

(*b*) Whole-time ASSISTANT CHEST PHYSICIAN AND DEPUTY PHYSICIAN SUPERINTENDENT at High Carley Sanatorium, Ulverston, Lancs (150 Beds; Thoracic Surgery Centre). Post normally resident. Applicants must have had wide experience in the diagnosis and treatment of pulmonary tuberculosis and of the pre- and post-operative care of cases undergoing major thoracic surgery; higher qualification desirable. 7th May, 1954.

Salary £1300–£50–£1750 p.a.

Application forms from Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT PATHOLOGIST (whole-time), Mount Vernon Hospital, Northwood (517 Beds), in which are large regional centres for radiotherapy, plastic surgery and burns as well as general beds.

Applications by 10th May, 1954.

(2) CONSULTANT ANÆSTHETIST (whole-time or maximum sessions). Duties at hospitals in Barnet Group—mainly Barnet General Hospital (478 Beds) and Clare Hall Hospital (452 Beds). Experience in anæsthesia for thoracic surgery essential.

Applications by 8th May, 1954.

(3) CONSULTANT in Morbid Anatomy (whole-time), Hillingdon Hospital, Uxbridge, Middlesex (705 Beds).

Applications by 8th May, 1954.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR CASUALTY OFFICER at Swindon in the Senior Hospital Medical Officer grade. Tenable up to 4 years. Candidates should hold the F.R.C.S. or equivalent.

Applications (10 copies), stating age, qualifications and experience, with names and addresses of 3 referees, should reach the Secretary of the Board, 43, Banbury-road, Oxford, by 6th May, 1954.

PLYMOUTH CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of CONSULTANT ORTHOPÆDIC SURGEON in the Plymouth Clinical Area which comprises Plymouth, Kingsbridge, Tavistock, Launceston, Bude and Liskeard. The appointment may be held either on a whole-time or maximal (9 sessions) part-time basis. Applicants should have had wide experience in orthopædic and traumatic surgery. The successful candidate will have charge of beds at the South Devon and East Cornwall Hospital and at Mount Gold Orthopædic Hospital, Plymouth, and will be required to visit other hospitals in the Clinical Area as may be determined by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 8th May, 1954.

PLYMOUTH CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of Whole-time SENIOR CASUALTY OFFICER with duties mainly at the Plymouth, South Devon and East Cornwall Hospital, Plymouth. The successful candidate should possess a higher qualification in surgery and will be required to take charge of the Casualty Departments and work under the general supervision of the Consultant Surgeons and Orthopædic Surgeons in the Group. The appointment will be for a period not exceeding 4 years. Salary within the range £1300–£50–£1750 for candidate of 32 years and over, and £1200–£50–£1750 for candidate aged 30 years and less.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 8th May, 1954.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of CONSULTANT PHYSICIAN of junior status for 3 or 4 notional half-days a week with duties in the first instance at the Liverpool Royal Infirmary. The successful applicant will be required to carry out clinical and teaching duties. Candidates must possess a medical degree of a University of the British Commonwealth and the Fellowship or Membership of the Royal College of Physicians of London, Edinburgh or Ireland.

Applications, stating full particulars of nationality, age, qualifications and details of present and previous appointments, and accompanied by the names of 3 persons to whom reference may be made, should be sent by 1st May, 1954, to the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of CONSULTANT SURGEON of junior status for 5 notional half-days a week with duties in the first instance at the Liverpool Royal Infirmary. The successful applicant will be required to carry out clinical and teaching duties. Candidates must possess a medical degree of a University of the British Commonwealth and the Fellowship or Membership of the Royal College of Surgeons of England, Edinburgh or Ireland.

Applications, stating full particulars of nationality, age, qualifications and details of present and previous appointments, and accompanied by the names of 3 persons to whom reference may be made, should be sent by 1st May, 1954, to the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer grade) in West Fife. The duties will be chiefly at the Dunfermline and West Fife Hospital under the general supervision of the Consultant Anæsthetist for Fife. The post is superannuable, and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, previous experience and qualifications, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd May, 1954.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires CONSULTANT ANÆSTHETIST (whole-time or 9 half-days per week) for the Worthing (Sussex) Group. Duties mainly at Southlands Hospital, Shoreham.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.I.), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 15th May, 1954. Applicants may visit Hospital by local arrangement.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a CONSULTANT PHYSICIAN for 4 notional half-days a week to be domiciled in the Brighton and Lewes area. The duties will be mainly at the New Sussex Hospital for Women, Windlesham-road, Brighton, and, other things being equal, preference will be given to Women candidates. Possession of a Membership of a Royal College of Physicians is essential. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the Hospital concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 1st May, 1954.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time ASSISTANT PSYCHIATRIST for child guidance work at the Crayford Child Guidance Clinic, Woodside-road, Barnehurst, Kent, which is administered by the Kent Education Committee. Previous experience of child guidance is essential and possession of a higher qualification is desirable. Salary within the scale £1300–£50–£1750. Applicants may visit the Clinic.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 1st May, 1954.

SOUTHEND-ON-SEA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for temporary post of ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer grade), with principal duties at the General Hospital, Southend. Post vacant at the end of April for a period of 3 months, thereafter on a month-to-month basis.

Applications, &c., to the undersigned by 22nd April, 1954.

J. C. FIELD, Secretary.

Management Committee Offices, General Hospital, Rochford, Essex.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Locum ANÆSTHETIST required at Scunthorpe and District War Memorial Hospital from 20th April, for minimum period of 1 month. Remuneration at rate of 31½ guineas per week with a deduction if resident.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum SENIOR HOSPITAL MEDICAL OFFICER in Psychiatry required from 1st May at The Lawn, Lincoln, for a minimum period of 3 months. Accommodation is available, if desired. Remuneration at the rate of 31½ guineas per week.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Resident Locum ANÆSTHETIST (Senior Hospital Medical Officer grade) required immediately at the Mansfield Hospitals for 1 month in first instance. Remuneration at the rate of 31½ guineas per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum ANÆSTHETIST required for the Rotherham and Mexborough Hospitals from 24th April, for a minimum period of 2 months. Remuneration at the rate of 31½ guineas or 45 guineas per week according to status.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time DEPUTY PHYSICIAN SUPERINTENDENT required for Leicester Isolation Hospital and Chest Unit, Groby-road, Leicester. Clinical duties mainly concerned with chest work but candidates should have good general medical experience and special experience in the treatment of chest diseases and tuberculosis. Salary scale £1300–£50–£1750. The Hospital includes a major Department of Chest Surgery and an Out-patient Department.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Completed forms to be returned by 14th May, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Kingsway Hospital, Derby. A house will be available. Salary £1300–£50–£1750.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 8th May, 1954.

WALSALL, WEST BROMWICH AND BIRMINGHAM (MENTAL A) GROUPS OF HOSPITALS. Whole-time CONSULTANT CHILD PSYCHIATRIST. Duties at Child Guidance Clinics on behalf of the County Boroughs of Walsall (4 notional half-days weekly) and West Bromwich (4 notional half-days). Appointment linked with Winson Green Hospital, Birmingham (3 notional half-days). Special training in child guidance work and wide experience psychiatry required.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, Birmingham Regional Hospitals Board, 10, Augustus-road, Birmingham, 15, before 3rd May, 1954.

WELSH REGIONAL HOSPITAL BOARD. Locum E.N.T. CONSULTANT (Caernarvon and Anglesey General Hospital) 17th May–11th June, 1954.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Locum CONSULTANT RADIOLOGIST (St. David's Hospital, Cardiff), 1st–28th August, 1954.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

NEWFOUNDLAND PROVINCIAL DEPARTMENT OF HEALTH, ST JOHN'S, NEWFOUNDLAND, CANADA.

Tuberculosis Sanatorium, St. John's

ASSISTANT SUPERINTENDENT. Salary $8000 per year (approximately £2963). This post will require considerable previous experience, both in clinical tuberculosis and administration.

2 SENIOR RESIDENT PHYSICIANS. Salary $6000 per year (approximately £2222). Applicants require 2 years experience in clinical tuberculosis. Because married quarters in the institution are not available, posts are more suited for unmarried men. A deduction of $50 (approximately £18) monthly is made for board and quarters.

3 JUNIOR RESIDENT PHYSICIANS. Salary $4000 (approximately £1481), less $50 (approximately £18) per month for board and quarters. These posts will be suitable for recently qualified graduates without special experience in tuberculosis. Officers will be eligible for senior status after acquiring 2 years experience. The St. John's Sanatorium has 460 Beds, and is located at St. John's on the East Coast of Newfoundland. It serves an area of approximately 150,000 people and provides wide experience in all types of pulmonary tuberculosis.

Western Sanatorium, Corner Brook

SENIOR CLINICAL TUBERCULOSIS OFFICER. Salary $7500 p.a. (approximately £2777). This post will require considerable previous experience in clinical tuberculosis. The institution is located at Corner Brook on the West Coast of Newfoundland and has 280 Beds. It serves the entire western portion of Newfoundland and also provides wide experience in all types of pulmonary tuberculosis.

Note: All applicants would be required to engage for a minimum period of 2 years. Passage to Newfoundland and return after the expiry of a 2-year contract is provided.

Applications should be addressed to Doctor JAMES MCGRATH, Newfoundland Department of Health, c/o British Medical Association, Medical Practices Advisory Bureau, Tavistock-square, London, W.C.1. Interested applicants should apply immediately, as an official from Newfoundland will visit England to arrange personal interviews about the middle of April. (8281.)

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. UNIVERSITY OF OTAGO, NEW ZEALAND. Applications are invited for the position of JUNIOR SPECIALIST ANÆSTHETIST, Dunedin Hospital, LECTURER in Anæsthetics, Otago Medical School, which will be vacant in June, 1954, from those who hold a Degree in Medicine of an approved University. The position is full-time and private practice is not permitted. The position is designated as that of Junior Specialist under the Hospital Employment (Medical Officers) Regulations, 1952, Amendment No. 1. Salary scale £1290–£1590 (plus cost-of-living bonus £46–£62 p.a.) by annual increments of £50. Commencing salary according to qualifications and experience. Duties will include the practical teaching of anæsthetics to medical and dental students. The position is non-resident.

Applications for this position should be made on the prescribed form obtainable from the Office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2, or from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, who will supply further information and conditions of appointment. Applications should be in the hands of the undersigned not later than 10 A.M. on Monday, 31st May, 1954.

W. A. WILLIAMSON, Secretary.

P.O. Box 946, Dunedin, New Zealand.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for the post of CONSULTANT PHYSICIAN to the Mid-Ulster Hospital, Magherafelt. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44/46, Queen-street, Belfast, and will be received not later than 15th May, 1954.

Hospital Services: Junior Appointments

ACTON HOSPITAL, Gunnersbury-lane, W.3. Senior HOUSE OFFICER (casualty) required for 1 year from 17th May, 1954. Resident post.

Applications, with copies of 2 testimonials, to Hospital Secretary by 1st May, 1954.

BEARSTED MEMORIAL HOSPITAL (Jewish Maternity HOSPITAL), The Green, HAMPTON COURT. RESIDENT OBSTETRIC HOUSE OFFICERS (third post) required at above Hospital, for 6 months commencing 1st July, 1954. Previous obstetric experience an advantage. Recognised for the D.Obst. R.C.O.G.

Application forms from the Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, which should be returned at once.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER/HOUSE SURGEON (resident). House Officer or Senior House Officer grade according to experience.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary (L).

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in X-ray Department. Whole-time, non-resident appointment for 1 year in first instance, under supervision of Consultant, will include teaching and some work in Mass X-ray both within and outside the Hospital. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 1st May, 1954.

CHARING CROSS HOSPITAL, W.C.2. Locum Full-time SURGICAL SENIOR REGISTRAR (non-resident), for 3 months from 20th April, 1954.

Application forms obtainable from FRANK HART, House Governor and Secretary to the Board.

GUY'S HOSPITAL. YORK CLINIC FOR PSYCHO-LOGICAL MEDICINE. Required, RESIDENT HOUSE PHYSICIAN (Male), grading Senior House Officer (£670), duties to commence as soon as possible. The post offers good opportunities for postgraduate study. The appointment will be for a period of 6 months in the first instance, and may be renewed for further such periods.

Applications, with copies of 2 testimonials, should be sent to the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 24th April, 1954.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications from registered medical practitioners for the posts of HOUSE OFFICERS (casualty) (1 with additional duties in the Skin Department and 1 with additional duties in the E.N.T. Department), should be sent as soon as possible to the Group Secretary at the above address.

HOSPITAL FOR WOMEN, Soho-square, W.1. (Affiliated to the Middlesex Hospital.) Applications are invited for a full-time post of RESIDENT SENIOR GYNÆCOLOGICAL HOUSE OFFICER, vacant on 1st July, 1954. Appointment is for 6 months but the holder can apply for an extension of 6 months. Salary in accordance with the terms laid down for medical and dental staffs, less a deduction of £100 p.a. for residential emoluments. The appointment is recognised for the M.R.C.O.G. examination.

Applications, stating age, nationality, qualifications and experience, supported by the names and addresses of 3 referees, must reach the undersigned not later than Saturday, 24th April.

D. C. EMERY, Secretary.

HAMMERSMITH, WEST LONDON AND ST. MARK'S HOSPITALS BOARD OF GOVERNORS, Ducane-road, London, W.12. Applications invited for following appointments at Hammersmith Hospital and Postgraduate Medical School:—

7 HOUSE PHYSICIANS (general medicine). 3 vacant 1st July; 4 vacant 1st August.

1 CASUALTY OFFICER (Senior House Officer grading), vacant 14th June.

1 HOUSE PHYSICIAN (pædiatrics), vacant 1st July. Post recognised for D.C.H.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 1st May.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR in General Surgery at the London Hospital Annexe, Brentwood, Essex. A higher qualification is essential. The successful candidate will be required to be resident or to live within the vicinity.

Applications (12 copies), giving the names and addresses of 3 referees, should reach the House Governor by 8th May, 1954. Further particulars may be obtained on application.

H. BRIERLEY, House Governor.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. 2 RESIDENT HOUSE PHYSICIANS (registered medical practitioners) required for 1st June. 6 months appointment. General medicine.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 27th April.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5. Applications are invited for the appointment of SENIOR RESIDENT MEDICAL OFFICER at the Belgrave Hospital for Children, S.W.9, to start as soon as possible. The appointment is for 1 year in the first instance and will be in the grade of Registrar. Part of the duties involve work at King's College Hospital.

Applications, stating age, education, qualifications and experience, with the names of 2 referees, should reach the undersigned by 29th April, 1954.

S. W. BARNES, House Governor.

NEASDEN HOSPITAL, Brentfield-road, N.W.10. (Infectious Diseases.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR required at the above Hospital, which admits all types of acute infectious diseases, and offers wide clinical experience and opportunity for postgraduate studies. Post vacant 1st May, 1954, or shortly afterwards. Candidates may visit the Hospital by direct appointment with Physician-Superintendent.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 21st April, 1954.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) MEDICAL REGISTRAR (resident or non-resident), St. Clement's Hospital, Bow, E.3.

(2) MEDICAL REGISTRAR (resident or non-resident), Hackney Hospital, Homerton, E.9.

(3) SURGICAL REGISTRAR (resident), Black Notley Hospital, near Braintree, Essex. Post recognised for F.R.C.S.

(4) PÆDIATRIC REGISTRAR (resident or non-resident), Mile End Hospital, E.1.

(5) ANÆSTHETIC REGISTRAR (resident preferred), Harold Wood Hospital, Essex. Post recognised for D.A. and F.F.A.R.C.S.

(6) REGISTRAR in Pathology (non-resident). Chase Farm and other hospitals in the Enfield Group. Recognised for Diploma in Pathology of R.C.P. and S. Previous experience in pathology necessary.

(7) E.N.T. REGISTRAR (non-resident), West Ham Group of hospitals.

(8) REGISTRAR in Psychiatry (resident or non-resident), Severalls Hospital, Colchester, Essex.

(9) REGISTRAR in Psychiatry (resident or non-resident), Warley Hospital, Brentwood, Essex. Hospital recognised for training for D.P.M.

(10) MEDICAL REGISTRAR (pulmonary tuberculosis), resident, Ware Park Hospital, Herts.

Appointments subject to review after 1 year.

Separate applications in duplicate, detailing date of birth, qualifications, experience, present appointment, grade and salary, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 1st May, 1954.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC REGISTRAR required Social Psychotherapy Centre, 7, Fellows-road, London, N.W.3. Post vacant 28th May, 1954. 3 sessions per week. Appointment for 1 year in first instance. Clinic may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 1st May, 1954.

PLAISTOW HOSPITAL, Samson-street, London, E.13. Applications are invited for appointment of SENIOR HOUSE OFFICER (resident) to the Chest Unit and Infectious Diseases Unit at the above Hospital for 12 months. Previous experience in diseases of the chest is desirable. Excellent experience is afforded in the investigation of chest and infectious diseases cases and there are good facilities for postgraduate study for the M.R.C.P. examination.

Candidates should send their applications, with copies of recent testimonials, to M. J. HUNTLEY, Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 30th April, 1954.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE SURGEON to Orthopædic, Fracture, and Traumatic Department, E.N.T. Department, and SENIOR CASUALTY OFFICER (second or third post) for a period of 6 months, vacant 25th April.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE SURGEON (third post), for a period of 6 months, vacant 29th May.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 21st April.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT SENIOR HOUSE SURGEON, for a period of 6 months, vacant 23rd May.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 21st April.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON (third post), for a period of 6 months, vacant 16th June.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 15th May.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT SENIOR HOUSE SURGEON for Casualty, for a period of 6 months, vacant 25th May.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 21st April.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, W.C.1. The appointment is full-time, resident, for 6 months, duties to commence on 1st July, 1954. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 3rd May, 1954.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the following posts:—

(*a*) HOUSE OFFICER to the Infectious Diseases Department.

(*b*) HOUSE OFFICER to the Pædiatric Department.

Applicants would be expected to hold both resident posts consecutively for a period of 6 months each. Duties to commence on 1st July, 1954. Salary and conditions of service in accordance with those laid down by the Ministry of Health for House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, the Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 3rd May, 1954.

ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street and Queen-square, W.C.1. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON, now vacant. Post recognised for F.R.C.S. examinations. 6 months appointment. Salary on National Health Service scale. Candidates will be required to attend for interview.

Applications, stating age and full particulars, to Secretary.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of HOUSE SURGEON, vacant 24th May, 1954. Preference given to pre-registration candidates. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary by 24th April, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant 24th May, 1954.

Applications to be sent to the Hospital Secretary by 24th April, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of non-resident Whole-time REGISTRAR in General Medicine (2 vacancies). The successful applicants will be required to undertake work in the Casualty and Outpatient Departments as well as having certain inpatient duties. The 2 appointments will be for a first period of 12 months, as from 1st June, 1954, and 26th June, 1954, respectively.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 28th April, 1954.

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. Senior HOUSE OFFICER (anæsthetics). Recognised for F.F.A.R.C.S. and D.A. Vacant 1st May. 6 months appointment and may then be renewed. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of RESIDENT ASSISTANT CLINICAL PATHOLOGIST in the grade of Senior House Officer. Previous experience in laboratory work is not essential, but applicants should have held a clinical appointment. The appointment is for 1 year, with effect from 1st July, 1954.

Applications, giving details of age, education, qualifications, previous experience, and the names of 2 referees, should be addressed to the undersigned and received not later than 8th May, 1954.

P. H. CONSTABLE, House Governor.

SOUTH WESTERN HOSPITAL, Landor-road, Stockwell, S.W.9. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD, MEDICAL REGISTRAR required. The successful applicant will be required to take charge of the acute Medical Unit (32 Beds) at the Hospital, which unit is under the control of the Consultant Physician from Lambeth Hospital. In addition his responsibilities will include work in connection with some tuberculosis and infectious diseases beds at the Hospital. The appointment is normally for 2 years, and is subject to review at the end of the first year. Canvassing will disqualify but candidates are not precluded from visiting the Hospital if they so desire.

For the form of application apply (enclosing a stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 1st May, 1954.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from registered Women medical practitioners for the appointment of RESIDENT MEDICAL OFFICER, to become vacant 20th May, 1954. The post is of Senior House Officer status, and the appointment will be for a period of 1 year. Duties will include care of the children's ward.

Forms of application from the Secretary at the Hospital.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of OBSTETRIC HOUSE SURGEON. (Post recognised for the M.R.C.O.G.) Appointment is for a period of 6 months and is vacant on 17th June, 1954.

Forms of application from the Secretary.

WESTMINSTER CHILDREN'S HOSPITAL. Westminster HOSPITAL TEACHING GROUP. 2 HOUSE PHYSICIANS (both second pre-registration), required for 6 months from 1st June, 1954.

Applications, with copies of testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 1st May.

WHITTINGTON HOSPITAL, Highgate Hill, N.19. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Locum Tenens REGISTRAR required immediately for Orthopædics Department for at least 6 weeks.

Particulars to Medical Superintendent (Telephone : ARChway 3070).

WHITTINGTON HOSPITAL, London, N.19. North West METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (whole-time) required for General Medical and Gastro-enterological Department. Possession of a higher medical qualification desirable. The Hospital may be visited by appointment with the Medical Superintendent.

Application forms obtainable from and returnable to the Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, N.6, by 26th April.

ABERDEEN GENERAL HOSPITALS. BOARD OF MANAGEMENT. Applications are invited for the appointment of SENIOR HOUSE OFFICER in Anæsthetics with duties in the Aberdeen Royal Infirmary and other local hospitals if required. The post is non-resident. Conditions of service in accordance with the terms and conditions issued by the Department of Health for Scotland.

Applications, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERDEEN. CITY HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER. The duties include work in connection with general pædiatric and infectious diseases.

Applications, giving full details of age, qualifications and experience, together with the names of 2 referees, should be sent to the Group Medical Superintendent, Royal Aberdeen Hospital for Sick Children, Westburn-drive, Aberdeen, not later than 30th April.

ASHFORD (near), KENT. WILLESBOROUGH HOS-PITAL. Applications are invited for the appointment of HOUSE SURGEON at the above Hospital. Good experience in general surgery with some casualty work. Married quarters available. Salary £350, £400, or £450 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, should be forwarded to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD (near), KENT. WILLESBOROUGH HOS-PITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON (obstetrical and gynæcological) at the above Hospital. The appointment is recognised for the D.Obst.R.C.O.G. and will be tenable for a period of 6 months. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, should be addressed to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited for the appointment of RESIDENT HOUSE SURGEON (casualty and orthopædics) at the above Hospital. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited for the appointment of SENIOR HOUSE SURGEON at the above Hospital. Applicants should have held at least 3 hospital posts. The appointment will be tenable for a year. Salary £670 a year, less a deduction of £150 a year for residential emoluments.

Applications, stating age, qualifications and the names and addresses of 2 referees, should be made to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER or SENIOR HOUSE OFFICER, according to experience, in the Pædiatric Unit at Ashton-under-Lyne General Hospital. Recognised for the D.C.H. Post vacant mid-April.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 testimonials, should be forwarded to the Group Secretary, Astley-road, Stalybridge, Cheshire.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required at Ashton-under-Lyne General Hospital. Preference will be given to previous holders of House Officer posts. Vacant now.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 testimonials, should be forwarded to the Group Secretary, Astley-road, Stalybridge, Cheshire.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from newly qualified medical practitioners seeking pre-registration posts under the Medical Act, 1950, for the resident post of HOUSE SURGEON at the above Hospital. Busy General Hospital. Salary on national scale less deduction for board and lodging.

Applications, with 2 testimonials, to the Group Secretary, Mid-Wales Hospital Management Committee, General Hospital, Aberystwyth, immediately.

ALTON GENERAL HOSPITAL. (117 Beds.) Winchester GROUP OF HOSPITALS. Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN (Senior House Officer grade) with some experience of anæsthetics. Useful experience to be obtained in general medicine. The appointment is for 6 months in first instance. Vacant 18th April.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to Group Secretary, Royal Hampshire County Hospital, Winchester.

ALTON, HAMPSHIRE. HENRY GAUVAIN HOSPITAL (formerly Morland Clinics). (120 Beds.) LORD MAYOR TRELOAR GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required immediately for the above Hospital for period of 1 year. Salary £670 p.a. Non-pulmonary tuberculosis, orthopædic and general surgery. Married accommodation available in small cottage on estate at moderate charge. Primary or Final F.R.C.S. candidate preferred.

Apply as soon as possible to the Secretary, Lord Mayor Treloar Group Hospital Management Committee, Lord Mayor Treloar Orthopædic Hospital, Alton, Hants.

ALTON, HAMPSHIRE. TRELOAR ORTHOPÆDIC HOSPITAL. Applications are invited from registered medical practitioners for the post of Whole-time ORTHOPÆDIC REGISTRAR. Post provides experience in non-pulmonary tuberculosis and general orthopædics and includes attendances at peripheral clinics. Accommodation available for single or married man. Canvassing disqualifies but visit to Hospital welcomed.

Write to Secretary for application form.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE, AYLESBURY, BUCKS. Applications are invited for the following appointments:—

SENIOR HOUSE OFFICER (pathology) for a busy and well-equipped laboratory at Stoke Mandeville Hospital, in which all branches of pathology for 1000 Beds are undertaken. Single accommodation will be available in the Medical Officers' Quarters.

Applications, with copies of 2 testimonials, should be forwarded to the Administrative Officer, Stoke Mandeville Hospital, Aylesbury, as soon as possible.

Stoke Mandeville Hospital

SENIOR DENTAL HOUSE OFFICER in the Department of Plastic Surgery and Jaw Injuries of Stoke Mandeville Hospital. Accommodation will be available in the Medical staff quarters.

Applications, with copies of 2 recent testimonials, to the Administrative Officer.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Senior House Officer grade), vacant 1st May and tenable for 12 months. The successful candidate will be required to reside at the Hulton Hospital (144 Beds) and the duties will include responsibility for infectious diseases and dermatological cases at the Hospital, together with some tuberculosis and general surgical cases, and may include medical or pædiatric outpatient and inpatient experience in the general hospitals of the Group. Previous pædiatric experience would be an advantage, but is not essential. Married quarters may be provided by arrangement, if required, at an agreed charge.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BOURNEMOUTH. CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of MEDICAL REGISTRAR at the above Hospital of 290 Beds (including 60 acute medical, chest and chronic sick beds). Applicants must be registered medical practitioners, and the possession of a higher qualification will be considered an advantage. The post is now vacant, and is tenable for 1 year in the first instance. Duties will include outpatient work at the Royal Victoria Hospital, Bournemouth.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of PATHOLOGICAL SENIOR HOUSE OFFICER (non-resident) at the above Hospital. Duties will be in all branches of pathology and there are full opportunities for wide experience. The post is now vacant, is tenable for 1 year, and is recognised for the Diploma in Pathology. Applicants may visit the laboratory by local arrangement.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of 2 HOUSE PHYSICIANS for posts becoming vacant 18th May, 1954. Both appointments are recognised for pre-registration purposes.

Applications to the Deputy Hospital Secretary.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 110 Beds.) SENIOR HOUSE OFFICER required who will advise the House Physician and House Surgeon in their work and whose duties will include responsibility for work in Surgery, Casualty, Midwifery and Gynæcology, and E.N.T. Departments. Post tenable for 1 year. Salary £670 p.a. Furnished flat available.

Applications, including the names of 3 referees, to Group Secretary, 19, Alexandra-road, Barnstaple.

BARNSLEY. BECKETT HOSPITAL. (182 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SURGICAL REGISTRAR required. Single accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 26th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BATH CLINICAL AREA. The Board of Governors of the UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Anæsthetics. The appointment will be held for 1 year in the first instance, and be renewable for a further year. The successful candidate will be required to work for the first year in the Bath Group of hospitals. The post is recognised for the D.A.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1954.

BATH CLINICAL AREA. South-Western Regional Hospital Board. Applications are invited from registered medical practitioners in general practice for the appointment of CLINICAL ASSISTANT in Pædiatrics to undertake 1 weekly session at the Manor Hospital, Bath. The successful candidate will work under the general direction of the Consultant Pædiatricians attached to the Bath Hospitals Group. Previous experience in pædiatrics is desirable. Payment will be at the rate of £175 p.a. per weekly 3½-hour session. The appointment will be held for 1 year, and duties will commence on 5th July, 1954.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 8th May, 1954.

BATH CLINICAL AREA. South-Western Regional Hospital Board. Applications are invited from registered medical practitioners in general practice for the appointment of CLINICAL ASSISTANTS in General Medicine to undertake 2 weekly sessions at the Royal United Hospital, Bath. The successful applicants will work under the general direction of the Consultant Physicians attached to the Bath Hospitals Group. Previous experience in general medicine is desirable. Payment will be at the rate of £175 p.a. per weekly 3½-hour session. The appointments will be held for 1 year, and duties will commence on 5th July, 1954.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 8th May, 1954.

BRADFORD ROYAL INFIRMARY. Senior House SURGEON (general and urology), vacant 1st May. Recognised for F.R.C.S. Salary £670 p.a., less £130 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary.

BRADFORD CHILDREN'S HOSPITAL. House Officer (Female), vacant 1st May. Recognised for D.C.H. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required 1st May as Senior Casualty Officer. Salary £700–£50–£1000.

Applications, stating previous posts held, together with names of 2 referees, to the Administrative Officer.

BRIGHTON. SUSSEX EYE HOSPITAL. (56 Beds.) HOUSE SURGEON required at the above Hospital, vacant now. Recognised for D.O. Successful applicant will be considered for senior post (Senior House Officer) on completion of 6 months.

Applications stating age, qualifications and experience, and naming 2 referees, to the Administrative Officer.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology), vacant on 1st June, 1954, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital. The successful applicant will be required to work in the Clinical Pathological Department.

Forms of application may be obtained from the House Governor and should be returned not later than 3rd May, 1954.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Birmingham (SELLY OAK) GROUP OF HOSPITALS. Whole-time REGISTRAR (non-resident) in E.N.T. Surgery. Duties in E.N.T. Department, Selly Oak Hospital (1090 Beds, including 39 E.N.T. beds). Successful candidate will spend approximately half-time in Otological Clinics in large factories in connection with M.R.C. investigations. Experience specialty and higher qualification an advantage.

Application forms from Secretary, Oak Tree-lane, Birmingham, 29, to be returned before 30th April, 1954. Candidates may visit Hospital.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

1. Coventry Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry

2 REGISTRARS for duties at Gulson Hospital, Coventry (312 Beds—106 medical, 81 general surgery). Experience specialty essential. Resident. (i) General Medicine, vacant 1st June; (ii) General Surgery, vacant 16th May; recognised for F.R.C.S.

2. Herefordshire Hospital Management Committee, Victoria House, Eign-street, Hereford

REGISTRAR in General Surgery. Duties mainly at General (154 Beds—71 surgical beds, including fracture and orthopædic) and County (310 Beds—40 surgical) Hospitals, Hereford. Post recognised for F.R.C.S. Resident.

3. Walsall Hospital Management Committee, Walsall General Hospital, Wednesbury-road, Walsall

REGISTRAR in General Surgery. Duties at Manor Hospital, Walsall (333 Beds). Experience specialty essential. Resident.

4. South Worcestershire Hospital Management Committee, Worcester Royal Infirmary

REGISTRAR in General Surgery, Worcester Royal Infirmary (206 Beds). Non-resident or resident. Higher qualification essential. Hospital recognised for F.R.C.S.

5. Shrewsbury Group Hospital Management Committee, Royal Salop Infirmary, Shrewsbury

REGISTRAR in Radiology (radiodiagnosis), duties with Shrewsbury Group and Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry. Resident or non-resident.

Application forms from Group Secretaries, to be returned before 3rd May, 1954. Candidates may visit hospitals.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Birmingham (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE. SURGICAL REGISTRAR. Duties in Burns Unit in conjunction with Medical Research Council at Birmingham Accident Hospital (209 Beds). Experience in general surgery essential. Experience in plastic surgery and possession of higher surgical qualification an advantage.

Application forms from Group Secretary, Oak Tree-lane, Birmingham, 29, to be returned before 30th April, 1954. Candidates may visit Hospital.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. House SURGEON required (recognised for pre-registration and by the Royal College of Surgeons for the F.R.C.S.) in Unit of General Surgery (approximately 85 Beds) under the control of 2 Consultant Surgeons. Vacant on 1st May, 1954.

Applications to the Secretary, enclosing copies of 2 recent testimonials.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. HOUSE SURGEON (resident) (pre-registration post) required.

Detailed applications, accompanied by 2 recent testimonials, to the Secretary, Dudley Road Hospital, Birmingham, 18.

BLACKBURN (near). CALDERSTONES HOSPITAL, Whalley, near BLACKBURN, LANCS. (For Mental Defectives—2300 Beds.) CALDERSTONES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. Salary scale £700–£50–£1000. National Health Service conditions of service and superannuation scheme. Unfurnished house available for rent to married man; residential quarters available for single man.

Applications, stating age, qualifications and experience together with the names and addresses of 3 referees, to be submitted to the Medical Superintendent, Calderstones Hospital, Whalley, near Blackburn, as soon as possible.

BRISTOL (near). BARROW HOSPITAL, Barrow GURNEY. BRISTOL MENTAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER. Experience in general medicine or in neurology is an advantage. The Hospital Group includes Modern Admission Units, Neurosis Centre, and Day Hospital, with Departments of Applied Psychology, Electro-encephalography, and Biochemical Research. The appointment offers opportunities for experience in many aspects of acute and chronic psychiatric illness.

Applications, giving details of experience, and the names and addresses of 3 referees, should be made to the Medical Superintendent, Barrow Hospital, Barrow Gurney, near Bristol, not later than 2 weeks after the appearance of this advertisement.

BRISTOL CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of SENIOR REGISTRAR in the Department of Neurosurgery, Frenchay Hospital, Bristol. The appointment will be held for 1 year in the first instance, but may be renewed thereafter on an annual basis.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April 1954.

BRISTOL CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners in general practice for the appointment of CLINICAL ASSISTANT in Orthopædic and Traumatic Surgery to undertake 2 weekly sessions (probably on Monday mornings and Friday afternoons) at Weston-super-Mare General Hospital. The successful candidate will work under the general direction of the Consultant Orthopædic Surgeon. Previous experience in orthopædic and traumatic surgery is essential. Payment will be at the rate of £175 p.a. per weekly 3½-hour session.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1954.

BRISTOL. COSSHAM / FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. HOUSE SURGEON (Thoracic Surgery Department). House Surgeon required in the above department, which is the regional Thoracic Surgery Centre (120 Beds) for the South West.

Applications with full particulars should be addressed to the Group Secretary Frenchay Hospital, Bristol, quoting "Thoracic."

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Southmead Hospital (571 Beds, including 133 maternity) RESIDENT SENIOR HOUSE OFFICER (surgical) for 12 months, commencing 1st June, 1954. Post recognised for F.R.C.S. examination.

Applications, on forms to be obtained from the undersigned, to be returned not later than 24th April, 1954.

C. C. HANCOCK, Group Secretary.

Southmead Hospital, Bristol.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. SENIOR HOUSE OFFICER (surgical), resident or non-resident, at the above Hospital. Salary and conditions of service in accordance with national rules.

Applications should be made to—

H. WILKINSON, Esq., Group Secretary.

Bury General Hospital, Bury, Lancs.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) SENIOR HOUSE OFFICER for casualty and orthopædic duties required. Post recognised for F.R.C.S.

Inquiries and applications to Hospital Secretary.

CAERPHILLY HOSPITAL. (Married quarters. 144 Beds for general surgery, orthopædics, E.N.T., ophthalmology and gynæcology; 26 Beds for general medicine.) SENIOR HOUSE OFFICER and 2 HOUSE SURGEONS (pre-registration if suitable candidates available) required. Hospital situated near Cardiff.

Apply to Secretary, Hospital Management Committee, Caerphilly, near Cardiff.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (430 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RADIOLOGICAL REGISTRAR. 1 of the 2 Registrar posts in the Diagnostic X-ray Department will become vacant at end of April, 1954. Applicants must possess at least the D.M.R.(D.), Part I.

Application forms may be obtained from the Group Secretary, Woking and Chertsey Group Hospital Management Committee, "Huntington," Guildford-road, Chertsey, Surrey. Completed forms must be returned by 26th April, 1954. The Department may be visited by arrangement with the Senior Radiologist (Ottershaw 441).

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (430 Beds.) Applications are invited for the post of SENIOR MEDICAL REGISTRAR which becomes vacant at end of April. The Hospital may be visited by arrangement with the Physician-Superintendent.

Application forms can be obtained from, and should be returned by 30th April, 1954, to, the Group Secretary, Woking and Chertsey Hospital Management Committee, "Huntington," Guildford-road, Chertsey.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (43**0** Beds.) Required, SENIOR HOUSE OFFICER (Orthopædic Department). Previous orthopædic experience not essential. Appointment very suitable for candidate reading for a higher grade qualification and is recognised for the F.R.C.S.

Applications, together with names and addresses of referees, to Physician-Superintendent, as soon as possible.

CHESTERFIELD HOSPITAL MANAGEMENT COM-MITTEE. Whole-time NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required for Whittington Hall, Chesterfield (372 female mentally deficient patients) and Scarsdale Hospital, Chesterfield. Salary £700–£50–£1000 p.a.

Apply M. H. BOONE, Secretary, from who further particulars may be obtained.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts:—

Essex County Hospital, Colchester (189 Beds)

SENIOR HOUSE OFFICER (Casualty and Radiotherapy Departments). Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. The successful candidate will be called upon to give anæsthetics in other hospitals in the Group.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

Black Notley Hospital, Braintree, Essex (544 Beds)

SENIOR HOUSE OFFICER to Pulmonary Tuberculosis Unit (198 Beds). Post tenable for 1 year.

HOUSE OFFICER (orthopædic surgery). First, second, third or pre-registration post, tenable for 6 months. Recognised for F.R.C.S. Salary as scale, plus £50.

Applications with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

CROYDON GROUP HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiology (diagnostic). Whole-time non-resident for Group. Candidates should have a Diploma in Radiology. Hospitals in Group may be visited by appointment with Radiologist.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned not later than 29th April.

CHESTER-LE-STREET. GENERAL HOSPITAL. (207 Beds.) Pre-registration HOUSE SURGEON (general surgery). This post is vacant now.

Applications to Group Secretary, Dryburn Hospital, Durham.

DERBY. DERWENT HOSPITAL. (187 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (chest and infectious diseases) required. A Consultant Thoracic Surgeon attends this Hospital each week. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 26th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY (near). PASTURES HOSPITAL, Mickleover, near DERBY. (1465 Beds. Recognised for training for D.P.M.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (psychiatry) required. Appointment for 1 year in first instance. A house is available.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 26th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) HOUSE OFFICER (general surgery), first, second, or third post, vacant 1st May, 1954, and tenable for 6 months. Recognised pre-registration appointment. The Hospital has a Surgical Unit of 66 Beds and is recognised for the F.R.C.S. Casualty duty is shared with 3 other House Officers.

Applications, with full particulars to the Administrative Officer at the Hospital.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) RESIDENT SURGICAL OFFICER (Senior House Officer grade), vacant 1st May. The Surgical Unit comprises 66 Beds, and the Hospital is recognised for the F.R.C.S.

Applications, giving full details, to the Administrative Officer at the Hospital.

DOVERCOURT. HARWICH AND DISTRICT HOS-PITAL. (30 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DURHAM. COUNTY HOSPITAL. (120 Beds.) Pre-registration HOUSE SURGEON (orthopædics). The Hospital is the main Orthopædic and Accident Hospital for the area. Post vacant now.

Applications to Group Secretary, Dryburn Hospital, Durham.

EDGWARE GENERAL (formerly Redhill County) HOS-PITAL, EDGWARE, MIDDLESEX. 2 RESIDENT HOUSE SURGEONS required for above Hospital. Posts vacant 23rd and 29th May, 1954. Salary £350–£450 p.a. according to experience, less £100 p.a. for board, lodging, &c. 6 months appointment.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 24th April, 1954. Candidates selected for interview will be notified by 1st May, 1954.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Appointment of House Officers. Applications are invited for the following appointments :—

Cumberland Infirmary, Carlisle (340 Beds)

1 HOUSE OFFICER (" Specials "—E.N.T. and Eyes).

1 SENIOR HOUSE OFFICER (orthopædics).

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgery) as Casualty Officer and Orthopædic House Surgeon. Immediate vacancy. Recognised training post for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 testimonials, to the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, immediately.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) Pre-registration HOUSE SURGEON (resident) to the Consultant in general surgery (25 Beds) and the Consultant in E.N.T. surgery (7 Beds). Post vacant 18th May, 1954. Busy general hospital with easy access to London.

Applications, with copy of testimonial from medical school, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 24th April, 1954.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 16th May. Pre-registration post but registered practitioners may apply. Recognised for F.R.C.S.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent immediately to Group Secretary at above address.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN, vacant 1st June, 1954. The post is also open to pre-registration practitioners.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 24th April, 1954.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE PHYSICIAN (second or third post), vacant 1st June, 1954. General medical duties. 6 months appointment.

Applications, with the names of 2 referees, to the Secretary, Enfield Group Hospital Management Committee.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT OBSTETRICAL AND GYNÆCOLOGICAL HOUSE SURGEON (second or third post; approved pre-registration post), required immediately. R practitioners holding first posts may apply. 6 months appointment with possible extension to 8 months. Unit comprises 50 maternity and 40 gynæcological beds, and is recognised for purposes of D.Obst.R.C.O.G. and M.R.C.O.G. examination, but advertised post is only recognised for D.Obst.R.C.O.G.

Applications, with the names of 2 referees, to the Secretary of the Management Committee, Chase Farm Hospital, Enfield, Middlesex.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Orthopædics. Duties at above Infirmary.

Write not later than 24th April, 1954, giving 3 names for reference, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GLASGOW, N. STOBHILL GENERAL HOSPITAL. PSYCHIATRIC UNIT. HOUSE OFFICERS (resident), Male or Female, required now. 180 Beds, 1200 admissions yearly, acute treatable cases. Unit recognised for D.P.M.

Apply to Medical Superintendent.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for Orthopædic, Fracture and Accident Service. Previous surgical and orthopædic experience would be an advantage. Post recognised for F.R.C.S. Excellent Medical Library facilities. Locum would be considered.

Applications should be sent immediately to the Hospital Secretary, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. (226 Beds. Recognised for Training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required from 1st July, 1954. Married accommodation may be available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 26th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

HALIFAX GENERAL HOSPITAL. (86 midwifery beds : 40 gynæcological beds.) SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required. Male or Female. Recognised for M.R.C.O.G. Average 1450 deliveries annually. Duties also at Royal Halifax Infirmary (46 midwifery beds and 10 gynæcological beds ; 530 deliveries annually). Salary £670 p.a., with deduction of £130 p.a. for board-residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX GENERAL HOSPITAL. (425 Beds.) Obstetric HOUSE SURGEON required. 90 obstetric and 40 gynæcological beds. Post, which is vacant 22nd May, is recognised for D.Obst. R.C.O.G.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in General Surgery required. Post now vacant. Salary £670 p.a., with deduction of £130 p.a. for board-residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER required for duties in the Casualty and Orthopædic Departments of the above Hospital. Post recognised for F.R.C.S. Salary £670 p.a., with deduction of £130 p.a. for board-residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE SURGEON required. Post now vacant. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS AND ST. LEONARDS. BUCHANAN HOSPITAL. (94 Beds.) SENIOR HOUSE OFFICER required for Urology and Children's Surgery. Post, vacant 20th May, is recognised for F.R.C.S. and may be tenable for 6 or 12 months. National scale of salary.

Apply to Hospital Administrator.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. (170 Beds. 5 residents.) RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer) required. Post vacant 1st May, 1954.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary.

HENLEY-ON-THAMES. PEPPARD CHEST HOSPITAL. (244 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident), vacant immediately. Surgical experience an advantage, as post provides opportunity for work in Thoracic Surgery Unit. Salary and conditions of service as recommended by Ministry of Health. Deduction for residence, &c., £150 p.a. Further particulars available from Physician-Superintendent at Hospital.

Applications, stating age, nationality, qualifications with dates, present post, with copies of recent testimonials, to Group Secretary, 3, Craven-road, Reading.

HEREFORD GENERAL HOSPITAL. (154 Beds—71 surgical.) HOUSE OFFICER (general surgery), vacant from 1st May, 1954. Hospital recognised by Royal College of Surgeons.

Applications, with copies of 2 recent testimonials, to the Secretary, Hospital Management Committee, County Hospital, Hereford.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. Regis-TRAR in General Medicine required (705 Beds).

Application forms obtainable from and returnable to Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Pield Heath-road, Uxbridge, Middlesex, by 26th April.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident HOUSE SURGEON to Casualty Department required 1st May, for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Director, Lister Hospital, Hitchin, Herts.

HITCHIN. NORTH HERTS HOSPITAL. Senior House OFFICER in Obstetrics and Gynæcology required 17th May for 1 year. The post is recognised for the D.Obst.R.C.O.G. examination. There is a modern Maternity Unit with 42 Beds and there are 20 gynæcological beds.

Applications, stating age, qualifications and experience, with copies of 3 recent testimonials, to be sent as soon as possible to the Medical Director, Hitchin Hospitals, Lister Hospital, Hitchin, Herts.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General Acute—81 Beds.) Locum RESIDENT SURGICAL REGISTRAR required immediately. Salary £16 per week, less charge for residence at the rate of £140 p.a.

Apply to Hospital Secretary. (Telephone : HOUnslow 4448.)

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS required, to commence duty immediately. The posts are recognised as pre-registration appointments. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. ROYAL NORTHERN INFIRMARY. HOUSE SURGEON (general surgery) required from 20th April, 1954. Post recognised for pre-registration.

Applications, with references, to Medical Superintendent.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. ROYAL NORTHERN INFIRMARY. HOUSE SURGEON (E.N.T. and eyes), required immediately. Post recognised for pre-registration.

Applications, with references, to Medical Superintendent.

IPSWICH BOROUGH GENERAL HOSPITAL, Heath-road, IPSWICH. (273 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Orthopædic and Fracture Department (32 Beds), vacant 8th May.

Applications, with copies of 2 recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOS-PITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

KENDAL. WESTMORLAND COUNTY HOSPITAL. (80 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative clinics. The post is vacant now and normally tenable for 1 year.

Applications, with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary, Lancaster.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited for HOUSE SURGEON (E.N.T. and ophthalmology).

Applications as soon as possible to Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited for HOUSE OFFICER (anæsthetics). The post is recognised for D.A.

Applications as soon as possible to the Hospital Secretary.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Dispensary. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in the Receiving Room at the General Infirmary at Leeds. The post, which is resident, will be for a period of 6 months in the first instance.

Applications, stating age, qualifications and previous posts with dates, should be forwarded to the undersigned not later than 23rd April, 1954.

J. ARNOLD TUNSTALL, Secretary to the Board.

The General Infirmary, Leeds, 1.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of RESIDENT ORTHOPÆDIC OFFICER at the General Infirmary at Leeds. The post is of Senior House Officer status and will be for an initial period of 6 months, renewable for a further 6 months thereafter.

Applications, stating age, qualifications, and previous posts with dates, together with the names of 3 referees, are to be forwarded immediately to the Secretary to the Board, The General Infirmary, Leeds, 1.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Urology at the General Infirmary at Leeds. The post, which is resident, will be for a period of 6 months in the first instance.

Applications, stating age, qualifications and previous posts with dates, should be forwarded to the undersigned not later than 23rd April, 1954.

J. ARNOLD TUNSTALL, Secretary to the Board.

The General Infirmary, Leeds, 1.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Anæsthetics

Hull A Group, with additional duties at hospitals in the Hull B and East Riding Groups (non-resident).

Chest Diseases

Scotton Banks Sanatorium, Knaresborough (resident).

General Surgery

Otley General Hospital (resident) (50 surgical beds). Consultant staff mainly from Leeds Teaching Hospitals. Appointment includes 2 sessions clinical work at the General Infirmary at Leeds.

Infectious Diseases

Leeds Road Hospital, Bradford (120 I.D. beds) (resident).

Obstetrics and Gynæcology

Halifax General Hospital with additional duties at the Royal Halifax Infirmary (130 obstetric beds and 50 gynæcological beds). The appointment is recognised for the M.R.C.O.G. (resident).

Orthopædic Surgery

(*a*) Woodlands Orthopædic Hospital, Rawdon (100 Beds), and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of accident and orthopædic surgery. May be non-resident.

(*b*) Royal Bath Hospital, Harrogate, duties in connection with the Regional Rheumatism Scheme (resident).

(*c*) Halifax Royal Infirmary (approximately 60 orthopædic beds) and at other hospitals in the Halifax Group (preferably resident).

Pædiatrics

Huddersfield and Halifax Groups (aggregate of 60 acute pædiatric beds) with additional duties in infectious diseases (preferably resident). Small flat available at Northowram Infectious Diseases Hospital, Halifax.

Psychiatry

*(*a*) Oulton Hall Hospital, near Wakefield, and affiliated Mental Deficiency Colonies (aggregating 780 Beds) (non-resident).

*(*b*) Storthes Hall Hospital, Kirkburton, near Huddersfield (2680 Beds), and associated clinics. Accommodation available for a single person.

(*c*) Research Registrar at Menston Hospital, near Leeds. The successful applicant will undertake work in connection with a research project already commenced in conjunction with the University Department of Biochemistry and Psychiatry. This work will occupy approximately half of the Registrar's time at present and candidates will be invited to submit proposals for the remainder. Previous experience of psychiatry is essential.

*Facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 23rd April, 1954.

LEEDS, 9. ST. JAMES'S HOSPITAL (SOUTH). Leeds A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of DEPUTY RESIDENT MEDICAL OFFICER (Senior House Officer), vacant 1st June, 1954.

Applications to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER (geriatrics), vacant 1st May, 1954.

Applications to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for temporary posts of SENIOR HOUSE OFFICER in Otorhinolaryngology at the Liverpool Ear, Nose and Throat Infirmary for the period to 30th September, 1954. The successful candidates will be eligible for reappointment for a further period from 1st October, 1954.

Apply as soon as possible on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a temporary post of SENIOR HOUSE OFFICER in Ophthalmology at the St. Paul's Eye Hospital for the period to 30th September, 1954. The successful candidate will be eligible for reappointment for a further period from 1st October, 1954.

Apply by 28th April, 1954, on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) RESIDENT SENIOR HOUSE OFFICER (pathology). The post is vacant 1st June, 1954, and is tenable for 1 year. The successful applicant will work under the direction of the Consultant Pathologist in the Central Laboratory.

Applications, stating age, qualifications, and experience, along with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary, Lancaster.

LEICESTER (near). CARLTON HAYES MENTAL HOSPITAL, NARBOROUGH, LEICESTER. LEICESTER NO. 4 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of Locum JUNIOR HOSPITAL MEDICAL OFFICER at above Hospital. The Hospital is recognised for training for D.P.M. Salary and conditions of service are those laid down for hospital medical staff in the National Health Service (England and Wales). Single accommodation in the Hospital is available if necessary at a charge of £150 p.a.

Applications, giving full particulars of the names and addresses of 3 referees, should reach the Medical Superintendent at the Hospital not later than 30th April, 1954.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Senior HOUSE OFFICER (medicine) required.

Apply, giving full particulars, together with 3 testimonials, to—

R. W. HOWICK, Group Secretary.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Applications are invited for an approved Registration post in Surgery at the above Hospital.

Apply with full particulars to—

R. W. HOWICK, Group Secretary.

MANCHESTER (near). PRESTWICH (MENTAL) HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident) required. Single accommodation only available within the Hospital.

Applications, giving full personal details and the names and addresses of 2 referees, should be sent to the Medical Superintendent, Prestwich Hospital, Prestwich, near Manchester, not later than 24th April, 1954.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgical). This appointment, in a busy general hospital staffed by Manchester Consultants, affords excellent experience to suitably qualified candidates. Opportunity will be given to assist in the major surgical work of the Hospital. Post recognised under F.R.C.S regulations.

Full particulars should be forwarded to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of NON-RESIDENT SENIOR REGISTRAR in Psychiatry. The person appointed will be required to attend Consultant Psychiatric Clinics and take part in the treatment of inpatients and outpatients at hospitals in the Bolton area in association with the Consultant Psychiatrist. D.P.M. essential.

Forms of application may be obtained from the Senior Administrative Medical Officer of the Board, Cheetwood-road, Manchester, 8, and should be returned by 30th April, 1954.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. 3 RESIDENT CLINICAL PATHOLOGISTS. Posts vacant on 1st and 17th of August, and 1st September, 1954. Applicants should have held house appointments. Previous laboratory experience is not essential. Duties consist of routine clinical pathology under the Director of the Department of Clinical Pathology. The appointments are for 12 months at salaries of £670 p.a., less £130 p.a. for residence, &c.

Applications to be made on forms obtainable from the undersigned, and to be returned not later than 5th May, 1954.

G. H. TAYLOR, Secretary.

MAIDSTONE. MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the Kent County Ophthalmic and Aural Hospital, and the West Kent General Hospital, Maidstone (total beds 248). The post, which is vacant now, is of Senior House Officer grade, and carries a salary of £670 a year, less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A.R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. There are 55 E.N.T. beds and 6 specialist operating sessions each week. Valuable experience is available and the post is recognised for the purposes of the F.R.C.S. and the D.L.O. Salary will be £670 a year, less £150 a year for residential emoluments.

Applications immediately to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post vacant immediately. Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to Administrative Officer at Hospital as soon as possible.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (205 Beds. Recognised training hospital for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (orthopædics) required with duties in the Casualty Department. The successful candidate will also be required to undertake services at the Crow Hill Rehabilitation Centre, Debdale Hall, and other hospitals in the Group. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 26th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. Whole-time RESIDENT MEDICAL OFFICER (with medical and casualty duties) required at Senior House Officer rate of salary at the above Hospital. This post offers excellent experience to anyone preparing to enter General Practice. The Hospital has a busy Outpatient Department.

Apply to Secretary, General Hospital, Nottingham, stating age, qualifications, nationality, and experience, together with copies of testimonials or names of referees.

NEWBURY DISTRICT HOSPITAL. (90 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (resident), General Surgery, for above Hospital.

Applications, with 3 names for reference, to Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

NEWCASTLE REGIONAL HOSPITAL BOARD. Cherry KNOWLE HOSPITAL, RYHOPE, near SUNDERLAND. Locum REGISTRAR PSYCHIATRIST (whole-time), resident, for a period of 6–9 months. Salary £16 per week.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, immediately.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. 10 residents.) SENIOR HOUSE OFFICER (resident) required 15th May. The Fracture and Orthopædic Department is a modern self-contained Unit with its own Outpatient Department, X ray and Theatre. Good experience. Post recognised F.R.C.S. for 6 months and tenable 6 or 12 months as desired. Salary £670, less £120 board-residence.

Write, quoting 2 referees, to T. A. JONES.
64, Cardiff-road, Newport.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. 10 residents.) SENIOR HOUSE OFFICER in General Surgery (non-resident) required. The post is based here, but covers work at another hospital also. House Surgeons are engaged at both and the post is of a senior character, providing good experience. Salary £670.

Write, quoting 2 referees, to T. A. JONES, Group Secretary.
64, Cardiff-road, Newport, Mon.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. 10 residents. Recognised F.R.C.S.) SENIOR HOUSE OFFICER required for Casualty Department in June. This is the base Hospital in the Group and all medical and surgical emergencies are admitted through casualty, which is under the full-time charge of a Senior Hospital Medical Officer there being also 2 Senior House Officers. Post recognised for F.R.C.S. for 6 months and tenable 6 or 12 months as desired. Salary £670, less £120 for board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary.
64, Cardiff-road, Newport, Mon.

NORTH GLOUCESTERSHIRE CLINICAL AREA. The BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in General Medicine. The appointment will be held for 1 year in the first instance, and be renewable for a further year. The successful candidate will be required to work for the first year at the Gloucestershire Royal Hospital, Gloucester.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1954.

NORTH SHIELDS, NORTHUMBERLAND. PRESTON HOSPITAL. (331 Beds.) RESIDENT SENIOR OBSTETRIC AND GYNÆCOLOGICAL HOUSE OFFICER (Female) required.

Applications, from practitioners qualified at least 1 year, should be sent to Secretary.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required for 1 year in first instance. This post is recognised for F.F.A.R.C.S. examination.

Application forms obtainable from and returnable to the Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 26th April, 1954.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST. Salary £670 p.a. If residential accommodation required, deduction £150 p.a.

Applications, stating age, qualifications, experience, with names for reference, to Secretary (Group 6), Hospital Management Committee, St. Stephen's-road, Norwich.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER for the Casualty Department. Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry. Duties to commence as soon as possible.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—
General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. Resident HOUSE SURGEON required (Male or Female, also open to pre-registration candidates) at the above Hospital; duties to commence as soon as possible. Salary and conditions of service in accordance with published regulations. The appointment is for a term of 6 months.

Applications, stating age, qualifications, and experience, to be sent to HENRY M. STANLEY, Group Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell. Applications are invited from fully qualified medical practitioners for the post of SENIOR HOUSE OFFICER in the Obstetrical and Gynæcological Department (48 obstetrical beds, 11 gynecological beds and a small block for puerperal pyrexia). The appointment is for a period of 12 months commencing about mid-May. The Hospital is recognised for the M.R.C.O.G. (obstetrics only). Salary and conditions of service in accordance with the Ministry regulations.

Applications, stating age, qualifications and experience, also nationality, with copies of 3 recent testimonials, to be sent to—
General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, SENIOR HOUSE OFFICER for the above Hospital. Duties to commence on or about 23rd April, 1954. Salary £670 p.a., less a deduction of £150 for residential emoluments. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with testimonials, to be sent to—
HENRY M. STANLEY, Group Secretary.
General Hospital, Nottingham.

OXFORD. WARNEFORD AND PARK HOSPITALS. SENIOR HOUSE OFFICER wanted. Warneford Hospital (140 Beds) is developing as an acute Psychiatric Unit, specially related to research and postgraduate teaching. The adjacent Park Hospital is a Neurosis Centre (30 Beds) with daily outpatient clinics. Previous psychiatric experience not essential. This post is specially suitable for training for D.P.M., for which full facilities are available, including neurology and child psychiatry. Accommodation is available for single man or woman.

Further particulars may be obtained from the Physician-Superintendent, Warneford Hospital, Oxford, to whom applications should be sent with the names of 2 referees within 14 days.

PETERBOROUGH MEMORIAL HOSPITAL. East ANGLIAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR at above Hospital. The successful candidate will be required to share duties in Casualty Department. Post offers wide experience. Appointment for 1 year, renewable for second year.

Detailed applications, including age, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 3rd May, 1954. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

PONTYPOOL AND DISTRICT HOSPITAL, Pontypool, MONMOUTHSHIRE. (115 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required immediately. This is the senior resident post, and resident staff consists of 2 House Surgeons, a House Physician and this post. This is a busy acute general hospital with a good Outpatient Department and regular visits from Consultants. Post offers good practical experience in surgery. Salary £700–£50–£1000, less £150 board-residence.

Write, quoting names of 2 referees, to—
T. A. JONES, Group Secretary.
64, Cardiff-road, Newport, Mon.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of RESIDENT MEDICAL REGISTRAR. The post is tenable for 1 year in the first instance, to commence on 31st May, 1954.

Forms of application, obtainable from the Group Secretary, Bournemouth and East Dorset Hospital Management Committee, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS (pre-registration) required, 1 post becomes vacant on 18th May, 1954, and the other on 17th June, 1954. The Hospital is recognised for the F.R.C.S. and the F.R.C.S.E.

Applications to the Hospital Secretary.

PLYMOUTH CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for 2 joint appointments of REGISTRAR in General Surgery. The appointments will be held for 1 year in the first instance, and be renewable for a further year. During the first year, the successful candidates will work mainly at the South Devon and East Cornwall Hospital, Plymouth, but may be required to undertake duties in other hospitals in the Area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1954.

PLYMOUTH CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Anæsthetics. The appointment will be held for 1 year in the first instance, and be renewable for a further year. During the first year the successful candidate will work mainly at the South Devon and East Cornwall Hospital, Plymouth, but may be required to undertake duties in other hospitals in the Area as circumstances require. The Hospital is recognised for the D.A. and for the F.F.A.R.C.S.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1954.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON, Devonport, 18th May, 1954.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON (Orthopædic and Casualty Departments), vacant now.

Queen Alexandra Hospital

(124 surgical beds). Recognised for F.R.C.S.

SENIOR HOUSE SURGEON, vacant now.

Infectious Diseases Hospital (310 Beds—Fever and T.B.)

SENIOR HOUSE OFFICER, vacant now.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post, vacant 6th July, 1954, of NON-RESIDENT OPHTHALMIC REGISTRAR at the Portsmouth Eye and Ear Hospital with (rarely) duties at other hospitals in the Group. Preference will be given to candidates holding a specialist qualification.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 30th April, 1954. Canvassing will disqualify, but it is hoped that candidates will visit the Hospital by arrangement with the Secretary of the Group.

RICHMOND, SURREY. CASSEL HOSPITAL (for Functional Nervous Disorders) (GROUP 51). SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR. Candidates must have completed a general psychiatric training and possess experience in psychotherapy. The successful applicant, if he has not already done so, will be required to undergo a personal analysis. Canvassing will disqualify but applicants may visit the Hospital by appointment.

Application forms may be obtained from the undersigned and should be returned to the Secretary within 14 days of this advertisement. D. MALLION, Secretary,

Cassel Hospital Management Committee.

Ham Common, Richmond, Surrey.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident) required for duties in the Casualties and Admission Department. This is a large general hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required in the Obstetric and Gynæcological Unit consisting of 96 obstetric and 52 gynæcological beds. The post, which falls vacant on 18th May, 1954, is recognised for the D.Obst.R.C.O.G. and M.R.C.O.G.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SLOUGH. UPTON HOSPITAL. Anæsthetic Registrar (resident) required at above Hospital. Post recognised for D.A. Approximately 60% of duties performed at Upton Hospital and 40% shared between other hospitals in the Group. Hospital may be visited by direct appointment.

Application form obtainable from and returnable to Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 24th April.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. SENIOR HOUSE OFFICER (casualty) required.

Applications, stating age and qualifications, together with 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR HOUSE OFFICER (casualty) required immediately.

Applications, stating age and qualifications, to Hospital Secretary.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for SENIOR HOUSE OFFICERS (Male or Female) to fill 2 posts in the Psychiatric Unit at Stobhill Hospital, Glasgow. The appointments are resident and will be for 1 year in the first instance. The Unit consists of 180 Beds with 1200 admissions yearly and deals with acute treatable cases ; it is recognised for the D.P.M.

Applications, stating age, qualifications, experience and present appointment, and naming 3 referees, to be lodged immediately with the Secretary, Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. General Medicine. BRIDGE OF EARN HOSPITAL, PERTHSHIRE. Applications are invited for the post of REGISTRAR at Bridge of Earn Hospital, Perthshire (806 Beds—60 general medicine, 60 rehabilitation (geriatric) and 36 rheumatism). Preference to candidates with a higher qualification ; living-in accommodation available. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 1st May, 1954.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Psychiatry—main duties at the Royal Mental Hospital, Aberdeen, which comes under the Board of Management for the Aberdeen Mental Hospitals. Candidates should have experience in their specialty and preferably hold an appropriate higher qualification.

Applications, giving 2 names for reference, should be submitted by 24th April, 1954, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Psychiatry, Craig Dunain Hospital, Inverness.

Forms of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 1st May, 1954. A. M. FRASER, M.D.,

Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board,

Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for a post of SENIOR HOUSE OFFICER under the Joint Training Scheme in Hospital and General Practice, in which the Board and the Executive Council for the County of Inverness are associated. The scheme provides a combined training of 2 years duration for young medical practitioners intending to enter medical practice or a specialty. Concurrent experience in hospital and general practice is given in various departments of the hospitals at Inverness and with selected general practitioners in the town and surrounding district. The post is non-resident and the salary is £670 p.a.

Candidates should apply by 1st May, 1954, on forms obtainable from the undersigned, by whom further particulars will be supplied on request. A. M. FRASER, M.D.,

Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board,

Raigmore, Inverness.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT or NON-RESIDENT SENIOR HOUSE OFFICER to the E.N.T. Department. The Department is recognised for D.L.O. and F.R.C.S. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Registrar) at above Hospital.

Further details and application forms obtainable from and should be returned to Group Secretary, Odstock Hospital, Salisbury, within 14 days of the appearance of this advertisement.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following posts :—

REGISTRAR (non-resident) at the Sheffield Centre for the Investigation and Treatment of Rheumatic Diseases, a Research Unit run by the Board of Governors in conjunction with the Sheffield Regional Hospital Board. Previous experience in this work not essential.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, should be sent immediately to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SENIOR HOUSE OFFICER to the University Department of Medicine at the Royal Hospital. The post will become vacant on 1st May, 1954, and will involve, in addition to the care of patients, laboratory work of a biochemical nature.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, should be sent to the Superintendent, Royal Hospital, Sheffield, 1.

SHEFFIELD, 6. MIDDLEWOOD HOSPITAL. (2000 Beds.) SHEFFIELD NO. 2 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male or Female officers for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER at Middlewood Mental Hospital. Living quarters and residential services are available for single officers, and a flat will shortly become available for married officers. Remuneration will be in accordance with the terms and conditions of service issued by the Ministry of Health. There are good facilities for postgraduate study for the D.P.M. and there is full collaboration with the general hospital situate in the same grounds. Excellent laboratory and other special departments. Extensive Psychiatric Outpatient Service.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be forwarded immediately to the Medical Superintendent, Middlewood Hospital, Sheffield, 6.

R. EMERSON, Deputy Group Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for the D.A.) Applications are invited from suitably qualified practitioners (Male or Female) for the resident appointment of SENIOR HOUSE OFFICER in Anæsthetics, vacant 21st May. The post offers a wide experience in anæsthesia for general surgery, obstetrics and gynæcology and in the Departments of Urology and Thoracic Surgery.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and names of 2 persons to whom reference may be made, should be forwarded to the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. Department OF PATHOLOGY GROUP LABORATORY. Applications are invited for the appointment of SENIOR HOUSE OFFICER (clinical pathology), vacant 1st June, 1954. Resident accommodation is available and optional. Opportunities for training in morbid anatomy, biochemistry, hæmatology, and bacteriology. The work at this and the associated hospitals offers excellent experience to graduates who wish to make pathology their permanent career. The post is recognised for the D.Path.

Apply, giving details of age, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the undersigned at Nether Edge Hospital, Sheffield, 11. W. STANSFIELD, Secretary.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum RESIDENT SURGICAL REGISTRAR required from 16th April to 15th May at the Grantham and Kesteven General Hospital. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum REGISTRAR (orthopædics) required immediately at the Mansfield and District General Hospital. Remuneration at the rate of £16 per week with a deduction if resident.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum NON-RESIDENT SENIOR REGISTRAR (radiology) required immediately at the Leicester Royal Infirmary for 1 month in the first instance. Remuneration at the rate of £22 per week.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Resident Locum REGISTRAR (chest and infectious diseases) required immediately at Oakwood Hall Sanatorium and Chest Clinic, Rotherham. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum RESIDENT SURGICAL REGISTRAR required at the Moorgate General Hospital, Rotherham. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum RESIDENT REGISTRAR (orthopædics) required immediately at the Grimsby General Hospital. Remuneration at rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD NATIONAL CENTRE FOR RADIOTHERAPY. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (radiotherapy) required. Candidates should be in possession of Part I of D.M.R.(T.). The post offers excellent opportunities for research and great experience would be gained. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 26th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from general registered practitioners (Male or Female) for the appointment of RESIDENT HOUSE SURGEON in General Surgery, vacant 16th May, 1954. Recognised for the F.R.C.S., and approved for Pre-registration Service.

Applications, with references, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). The successful applicant will be allowed to attend for 2 days a month at The Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination. Vacant immediately.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to the Group Secretary, Royal Salop Infirmary, Shrewsbury.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible, to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER SENIOR HOUSE OFFICER (orthopædic) required for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required from 14th May. Post available to pre-registration candidates, and tenable for 6 months.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds) AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required immediately. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND GENERAL HOSPITAL. (250 Beds.) Applications are invited from registered practitioners or from pre-registration candidates for the post of RESIDENT HOUSE SURGEON, vacant on 1st May, 1954. Salary according to previous appointments held, less a charge of £100 p.a. for residential emoluments.

Applications, stating age, qualifications, previous experience, with copies of recent testimonials, to reach the undersigned by 21st April, 1954. J. C. FIELD, Secretary.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of DEPUTY CASUALTY OFFICER (Senior House Officer grade) with duties in the Fracture and Orthopædic Department. Post vacant 16th April.

Applications, stating age, qualifications, and experience, to reach the undersigned as soon as possible.

J. C. FIELD, Secretary.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (382 Beds.) MID HERTS GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (House Officer grade) required at the above Hospital. Post vacant 6th May, 1954, and tenable for 6 months. Duties mainly in the Pædiatric Department. Preference given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, as soon as possible.

ST. HELENS HOSPITAL. (196 Beds.) St. Helens and DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON (Senior House Officer grade).

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded immediately to N. RICHARDS, Secretary.

Group Office, Whiston Hospital, Prescot.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), Male or Female. Recognised for D.A. Post now vacant. Duties mainly at General Infirmary, Stafford (175 Beds), which is the main and acute general hospital of the Group.

Applications, with copies of 3 testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of SENIOR HOUSE OFFICER (surgical). 2 posts are available if no applicants are forthcoming for pre-registration appointments. The posts are recognised for F.R.C.S. examination.

Applications, giving details of previous appointments held, together with copies of recent testimonials, should be forwarded forthwith to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of HOUSE OFFICER (general surgery) pre-registration. 3 posts. Vacant shortly.

Applications, with copy testimonials, to be forwarded to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of SENIOR HOUSE OFFICER (anæsthetics), vacant shortly. Recognised for D.A.

Applications, stating age, qualifications, and experience, together with copy testimonials, to the Group Secretary at head office, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for HOUSE OFFICER (general surgery), vacant now. Hospital recognised for F.R.C.S. examinations, and the post is recognised for experience during the pre-registration period.

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of SENIOR HOUSE OFFICER (ophthalmics). Recognised for F.R.C.S. and D.O.

Applications, stating age, and experience, together with copy testimonials, to the Group Secretary at Head Office, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (gynæcology and obstetrics, mainly surgery). Recognised for M.R.C.O.G. (gynæcology).

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. BUCKNALL ISOLATION HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of SENIOR HOUSE OFFICER (medical) vacant shortly.

Applications, with copy testimonials and full details, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STANMORE, MIDDLESEX. ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, BROCKLEY HILL. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER for a period of 6 months; duties to commence 14th June.

Applications to be received not later than 7th May. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Gynæcological Department of the above Hospital.

Applications, stating age, qualifications, and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MORRISTON HOSPITAL. (500 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident appointment of SENIOR HOUSE OFFICER in the Anæsthetic Department of the above General Hospital with special Departments of Neurosurgery and Thoracic Surgery.

Applications, stating age, qualifications, and experience, should be addressed to the Medical Superintendent, Morriston Hospital, Swansea.

SWANSEA. MORRISTON HOSPITAL. (500 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON in the Neurosurgical Department at the above Hospital. The post is recognised for Pre-registration Service.

Applications, with full particulars, should be sent to the Medical Superintendent, Morriston Hospital, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for the new Maternity Unit of 44 Beds which will be opened shortly at the above Hospital.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glan- TAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

TREDEGAR GENERAL HOSPITAL. (20 miles from Newport and 24 from Teaching Hospital at Cardiff; 6 miles from the Vale of Usk, Surgical Unit of 50 Beds, with also 6 orthopædic beds, under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient and Casualty Departments.)

SENIOR HOUSE OFFICER (surgery).

HOUSE SURGEON (pre-registration if suitable candidate available).

Senior House Officer post tenable 12 months; salary £670, less agreed deduction for full residential emoluments. House Officer post tenable 6 months; salary £400–£500, less agreed deduction for married quarters and emoluments or £100 p.a. for single residential emoluments.

Apply with full particulars to the Group Secretary, Hospital Management Committee, St. Martins-road, Caerphilly, near Cardiff.

TREDEGAR, MONMOUTHSHIRE. ST. JAMES HOS- PITAL. (156 Beds for acute medical, geriatrics, obstetrics including abnormal cases—24 miles Cardiff and 6 Vale of Usk.) HOUSE OFFICER (pre-registration if suitable candidate available). Busy Pathology Department with Group Blood Bank. Salary £400–£500, less appropriate deduction for married quarters.

Apply with full particulars to Group Secretary, Hospital Management Committee, St. Martins-road, Caerphilly, near Cardiff.

TUNSTALL, BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for SENIOR HOUSE OFFICER (surgical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, as soon as possible.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) Required:—

JUNIOR HOSPITAL MEDICAL OFFICER, and

SENIOR HOUSE OFFICER.

Resident posts, unmarried. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 17th June. Preference given to persons seeking pre-registration post under Medical Act, 1950.

Applications, stating age, qualifications with dates, together with copies of 2 testimonials, to Hospital Secretary.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. THORACIC UNIT. Applications invited for the following appointment in the Leeds Regional Thoracic Centre (54 Beds) at Pinderfields General Hospital:—

SENIOR HOUSE SURGEON, salary £670 p.a., less a charge of £130 p.a. for board, lodging, &c., or

Locum SENIOR HOUSE SURGEON, salary £13 per week, less a charge of £2 10s. a week for board, lodging, &c.

Address written applications, with full particulars and 2 names and addresses for reference, to—

W. E. EASTWOOD, Deputy Group Secretary,
Hospital Management Committee No. 10 Wakefield B Group.
Victoria Chambers, Wood-street, Wakefield.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female), recognised for pre-registration, at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Registrar and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. Warrington and District HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from qualified practitioners for the vacancy of RESIDENT ANÆSTHETIST (Senior House Officer grade), Male or Female, at the Warrington Infirmary. Scale of salary £670 p.a., less £130 p.a. for residential emoluments.

Applications to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington.

WELLINGBOROUGH. PARK HOSPITAL. (201 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER to the Geriatric Unit of 40 Beds, at present non-resident, and vacant on 30th April, 1954. The unit is in close association with a similar larger unit at Kettering.

Applications, stating age, nationality, qualifications, and past experience, should be sent to the Group Secretary, General Hospital, Kettering.

WEST CORNWALL CLINICAL AREA. The Board of GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Orthopædic and Traumatic Surgery. The appointment will be held for 1 year in the first instance, and be renewable for a further year. The successful candidate will be required to work for the first year mainly at the Royal Cornwall Infirmary, Truro, but may be required to undertake sessions in other hospitals in the Area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1954.

WEST CORNWALL CLINICAL AREA. The Board of GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in General Surgery. The appointment will be held for 1 year in the first instance, and be renewable for a further year. During the first year the successful candidate will work mainly at the Royal Cornwall Infirmary, Truro, but will be expected to undertake duties in other general hospitals in the Area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1954.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

WOLVERHAMPTON GROUP OF HOSPITALS. Whole-time SENIOR REGISTRAR in Pædiatrics. Duties mainly at Royal Hospital, Wolverhampton (60 children's beds), recognised for D.C.H., and also at New Cross Hospital. Experience general medicine and pædiatrics essential. Higher qualification and advantage. Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with arrangements for interchange of Registrars agreed between the 2 Boards.

Application forms from Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 3rd May, 1954.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)
SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.
HOUSE OFFICER (Ear, Throat and Nose Department), vacant now.
HOUSE OFFICER (Casualty Department), vacant mid-May.

New Cross Hospital, Wolverhampton
HOUSE OFFICER (general surgery), vacant now.
HOUSE OFFICER (general medicine), vacant 30th April.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.
The Royal Hospital, Wolverhampton.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE SURGEON (non pre-registration). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WIRRAL. LEASOWE CHILDREN'S HOSPITAL, MORETON, WIRRAL, CHESHIRE. (223 Beds.) NORTH WIRRAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from duly qualified medical practitioners for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade) at the above Hospital specialising in the treatment of long-term orthopædic, non-pulmonary tuberculous and general pædiatric conditions. This appointment, now vacant, gives ample scope to a practitioner reading for a higher qualification. Salary in accordance with National Health Service regulations—i.e., £670 p.a., less £100 p.a. in respect of board, &c.

Applications, giving full details of age, qualifications and experience, together with names and addresses of 3 referees, to Hospital Secretary, Leasowe Children's Hospital, Leasowe, Moreton, Wirral, Cheshire.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area orthopædic team. Appointment for 6 months in first instance. Vacant immediately.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 6th June, 1954.

Applications, with copies of 2 testimonials, to the Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN required (Male or Female), for post vacant 1st June. Preference given to persons seeking pre-registration House Officer post under Medical Act, 1950.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 testimonials or names of referees, to Hospital Secretary by 30th April.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General and Orthopædic Surgery required (Male or Female). Post vacant 18th May. Recognised for F.R.C.S. Preference given to persons seeking pre-registration House Officer post under Medical Act, 1950. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and copies of recent testimonials or names of 2 referees, to Hospital Secretary by 2nd May.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE.

York. County Hospital (Acute Hospital of 269 Beds with full Consultant staff)
CASUALTY OFFICER (with charge of orthopædic beds), resident or non-resident (Junior Hospital Medical Officer grade), as soon as possible. Salary £700–£50–£1000, less £153 if resident. Recognised for F.R.C.S.

York, City Hospital (Modern General Hospital of 265 Beds with full Consultant staff)
CASUALTY OFFICER (with charge of orthopædic beds), resident or non-resident (Junior Hospital Medical Officer grade) as from 13th May. Salary £700–£50–£1000, less £153 if resident. Recognised for F.R.C.S.

York. Military Hospital (Civilian Wing) (60 Beds)
Required, SENIOR HOUSE OFFICER (resident or non-resident) as from 7th June. There are 18 gynæcological beds, 30 general surgical beds and 12 medical beds. The Hospital is associated with the County Hospital (general hospital of 269 Beds), where relief casualty and emergency work and relief work for House Surgeons may be undertaken and where residence can be provided. Salary £670, less £153 for residence.

York. Fairfield Sanatorium (63 Beds); **City Hospital** (265 Beds)
Required, SENIOR HOUSE OFFICER (non-resident) in Chest Diseases and General Medicine, as from 24th May, to spend half-time at Fairfield Sanatorium (63 Beds), and at the City Hospital where 8 beds are reserved for investigation of chest cases, and where outpatient refill clinics are held, the remainder of time at the County and City general hospitals (269 and 265 Beds respectively), in the Department of General Medicine. Previous experience in treatment of tuberculosis an advantage. Salary £670.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, immediately to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

YORK. THE RETREAT. Locum Tenens Medical Officer (Man or Woman) required for a period of 6 months, commencing as soon as possible. Previous psychiatric experience would be an advantage. Salary £12 weekly plus residential emoluments.

Apply, the Physician-Superintendent.

CASTLEREA. ST. PATRICK'S REGIONAL CHEST HOSPITAL. ROSCOMMON COUNTY COUNCIL. Applications are invited from medical practitioners for the temporary post of REGISTRAR at above Hospital. Applicants must since registration have had not less than 3 years practice, including 2 years satisfactory experience in surgery. It is preferable that 6 months of this 2 years shall have been spent in a recognised teaching hospital. Previous experience in thoracic surgery is desirable, but not essential. Salary £800 p.a., inclusive of all existing temporary bonuses, subject to a deduction of £150 p.a., in respect of full residential emoluments, where provided in kind.

Applicants should communicate with the undersigned at once, giving full particulars as to date and place of birth, education qualifications and experience, and state how soon could take up duty, if appointed. Latest time for receipt of applications is 5 P.M. on Friday, 23rd April, 1954.

T. D. WYER, County Secretary.
Courthouse, Roscommon, 6th April, 1954.

NEW YORK. NEW ROCHELLE HOSPITAL, NEW ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by American College of Surgeons and American Medical Association for Internship and Residency Training. Only graduates from approved university schools accepted. Term of Internship: 1st July, 1954–30th June, 1955. INTERNES—$150 per month plus full maintenance. Return passage to England paid by Hospital after completion of internship.

Apply Superintendent.

Public Appointments

COLONIAL MEDICAL SERVICE. Vacancies occur from time to time in territories covered by the Colonial Medical Service for Medical Officers for general duties, including hospital and district work. These appointments offer great scope for the practice of many branches of medicine and surgery with a considerable measure of independence and personal responsibility. Appointments can usually be made on a permanent basis with pension (non-contributory) at age 50 or 55; on a temporary basis, with gratuity; or by appointment from the National Health Service for periods not exceeding 6 years, with continuation of National Health Service superannuation contributions and the payment of a resettlement grant of 20% of the aggregate of colonial salary on leaving the colony. Salaries of Medical Officers are varied: for example, £950–£1850 p.a. in Nigeria; £865–£1590 p.a. in Kenya (with a cost-of-living allowance in addition); and £1155–£2044 p.a. in Malaya (with a cost-of-living allowance in addition). Starting salaries depend on age and experience, and officers holding certain higher qualifications are granted 4 additional increments on the salary scale. There are many specialist and administrative posts yielding higher pensionable salaries than those quoted above to which Medical Officers would expect to be appointed on promotion in the course of a normal career. Free passages are granted. Income-tax is low. Tours of service vary from 10 months in parts of West Africa to 3 or 4 years in, for example, Kenya. Houses with heavy furniture are provided in most territories at a rental of about 10% of basic salary. Annual local leave is permissible and generous home leave is granted after each tour. Study leave on full pay is granted subject to the needs of the service to those who wish to acquire higher qualifications and so equip themselves for promotion to specialist posts. Officers serving in East and Central Africa often prefer to educate their children within that area, where schooling is available, or in South Africa. The short tours in West Africa enable frequent visits to be made to children being educated at home. Many officers have their children with them in West Africa until they reach school age.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting CDE. 121/01).

DERBYSHIRE COUNTY COUNCIL. Applications are invited from Male medical practitioners for the whole-time appointment of SENIOR ASSISTANT MEDICAL OFFICER. The possession of the D.P.H. is essential and experience in mental deficiency work is desirable. The work will be largely administrative in connection with the Public Health and School Health Services, but other duties may be assigned to the Officer appointed, who will work under the direction of the County Medical Officer. Office accommodation will be provided in the Central Office. The salary is £1100 rising by annual increments of £50 to £1500 p.a., together with a travelling allowance in accordance with the County Council's scale.

Applications should be submitted to the undersigned so that they are received not later than 3rd May, 1954. Forms of application are not provided. The conditions of service will be supplied on request. J. B. S. MORGAN, County Medical Officer.

County Offices, St. Mary's-gate, Derby.

NOTTINGHAM. CITY OF NOTTINGHAM EDUCATION COMMITTEE. Applications are invited for the post of DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER on a salary scale £1050–£50–£1400 p.a. The appointment will be subject to the provisions of the Local Government Superannuation Acts, as amended by the National Health Service superannuation regulations.

Further particulars and forms of application may be obtained from the undersigned, to whom completed applications must be returned not later than 8th May, 1954.

F. STEPHENSON, Director of Education.
Central School Clinic, 28, Chaucer-street, Nottingham.

CANADA. SASKATCHEWAN PSYCHIATRIC SERVICES. Applications invited for 7 VACANCIES in Psychiatry (5 clinical, 2 research) in the provincial Psychiatric Services of the Province of Saskatchewan. Salary range from $5160 to $6384 with accommodation available in most cases. Consideration will be given to previous psychiatric experience and promotion is possible to Clinical Director at maximum $9300.

Written applications, with full particulars of training and experience, should be addressed as soon as possible to Saskatchewan House, 28, Chester-street, London, S.W.1. Interviews will be arranged early in April.

GOLD COAST LOCAL CIVIL SERVICE. Gold Coast MEDICAL SERVICE. SPECIALIST PHYSICIANS required to take charge of special medical wards in a large hospital and to give an opinion on cases referred to them by Medical Officers and private practitioners. Candidates should hold the Membership of 1 of the Royal Colleges of Physicians and have had 4 years full-time experience in the work of this specialty. Appointments are to the Gold Coast Civil Service on short-term contracts of 2 tours of 18–24 months in the first instance with gratuity on satisfactory completion of service. Basic salary scale would be £2400–£100–£2700 a year. Gratuity would be payable at the rate of £37 10s. for each completed 3 months of service. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights while in the Gold Coast (up to a maximum stay of 6 years). Salary, in this case, would be in the scale £1900–£100–£2200 a year, and officers would receive a resettlement grant of 20% of the aggregate of their Gold Coast salary at the end of their engagements. Quarters when available are provided at rental not exceeding £150 p.a. Income-tax at local rates. Free passages provided for Officer, wife, and up to 3 children under 13 years of age. Annual local leave is permissible and generous home leave is granted after each tour.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/13/017).

HER MAJESTY'S COLONIAL SERVICE. Bahamas. Applications are invited for the post of PATHOLOGIST AND VENEREAL DISEASE OFFICER at the Bahamas General Hospital. Appointment will be on agreement for 3 years. Salary is in scale £1150–£50–£1300 a year, starting salary depending upon qualifications and experience. Fees for pathological work undertaken on behalf of private practitioners may be retained. Quarters are not provided, but assistance towards rent of a furnished house will be given. Cabin-class passages will be provided for Officer, wife and up to 2 children on appointment and on completion of agreement. Assistance up to £40 is given towards cost of transporting heavy baggage. No income-tax. Generous leave on completion of agreement. Climate is excellent and healthy for Europeans. Social and recreational amenities are good. Candidates should hold qualifications registrable in the United Kingdom and should have had experience in pathology and venereal disease work.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/27/04).

SWANSEA. COUNTY BOROUGH OF SWANSEA. Applications are invited from duly qualified medical practitioners for the post of ASSISTANT MEDICAL OFFICER. Applicants must have had postgraduate resident hospital experience and should be under 45 years of age unless already holding a similar superannuable appointment. Salary £950–£50–£1300 p.a.

Application forms may be obtained from the Medical Officer of Health, Public Health Department, The Guildhall, Swansea, to whom they should be returned not later than Thursday, 6th May, 1954. Canvassing, either directly or indirectly is a disqualification. T. B. BOWEN, Town Clerk.

The Guildhall, Swansea, March, 1954.

LANCASHIRE COUNTY COUNCIL. Registered medical practitioners required for appointment of ASSISTANT DIVISIONAL MEDICAL OFFICERS in areas adjacent to Lancaster, Bolton, and Bury. Possession of D.P.H. desirable. Salary £950–£1300 p.a. Travelling and subsistence allowances where applicable. Posts superannuable and subject to medical examination.

Application forms and further particulars from County Medical Officer, East Cliff County Offices, Preston.

ROYAL NAVAL MEDICAL SERVICE

Candidates are invited for service as Medical Officers in the Royal Navy—preferably below 28 years.

They must be British subjects whose parents are British subjects, and be medically fit. No examination will be held but an interview will be required.

Initial entry will be for 4 years' short service after which gratuity of £600 (tax free) is payable, but permanent commissions are available for selected short-service officers.

Officers transferred to permanent commissions will be paid a grant of £1500 (taxable) on completion of 1 year's service.

Consideration will be given to the grant of up to a maximum of 7 years ante-date of seniority in respect of approved periods of service in recognised civil hospitals, etc.

For full details apply MEDICAL DIRECTOR-GENERAL, Admiralty, S.W.1.

HOVE. BOROUGH OF HOVE. Senior Assistant Medical OFFICER OF HEALTH; East Sussex County Council SCHOOL MEDICAL OFFICER. Applications are invited for the above permanent appointments from Male registered medical practitioners possessing the D.P.H. The combined salary will be £1050 p.a., rising by annual increments of £50 to £1400 p.a., of which £575, rising by annual increments of £25 to £750, will be payable by the Hove Borough Council, and the remainder by the East Sussex County Council. The person appointed will be entitled to car allowances in accordance with the respective Councils' scales. The posts are subject to compulsory contributory superannuation. The duties include work in connection with Public Health, Infectious Diseases, and School Medical Services. The person appointed will be required to devote one-half of his time to the County Council post and the other half to the Borough Council post, and to undertake additional duties and responsibilities from time to time in the latter post when the Medical Officer of Health of Hove is absent from duty. The successful candidate will be required to pass a medical examination.

Further particulars and application forms may be obtained from the undersigned to whom applications should be sent so as to arrive not later than Wednesday, 28th April, 1954.

Town Hall, Hove, 3. JOHN E. STEVENS, Town Clerk.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT EDUCATION COMMITTEE. Applications are invited from fully qualified and registered medical practitioners for the post of ASSISTANT SCHOOL MEDICAL OFFICER. Salary scale: £950–£1300 p.a. by annual increments of £50. The duties will consist of routine medical inspections in schools and clinic work. Holidays as school holidays. The appointment is subject to the provisions of the National Health Service superannuation regulations and is terminable by 1 months notice on either side. The successful candidate will be required to pass a medical examination.

Form of application, which may be obtained from the undersigned, should be completed and returned as soon as possible.

H. DIBDEN, Chief Education Officer.

Town Hall, Hanley, Stoke-on-Trent.

SURREY COUNTY COUNCIL. Appointment of Part-time PSYCHIATRIST. Applications are invited from medical practitioners for duties in connection with the Sutton Child Guidance Clinic (4 sessions per week). Candidates should possess the D.P.M. and have had previous experience of child-guidance work. Remuneration at the rate of 4 guineas per session.

Applications, stating age, qualifications and experience, with names of 2 referees, to County Medical Officer, County Hall, Kingston upon Thames, by 24th April, 1954.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

GOOLE, YORKSHIRE. Applications are invited for General Medical Practice VACANCY (urban). List at present approximately 2800. Accommodation available for purchase. Apply on Form E.C.16A to the undersigned, from whom further particulars may be obtained, not later than 24th April, 1954.

C. H. STABLER, Clerk, West Riding Executive Council.

5, St. John's-north, Wakefield.

Miscellaneous

To non-professional posts the notification of Vacancies Order 1952 applies

Young Assistant wanted, live in, London. Rota working. 2 afternoons off per week. Sundays off except for rota duty. Salary £800, rising to £900 second year. Ultimate, but not immediate, view. 2 referees required. State religion.—Address, No. 916, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

For Sale in Southern Rhodesia, small Specialist Practice, capable of expansion in any direction. Equipped surgery available, and also accommodation. Incumbent retiring.—Address, No. 915, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Modernised residence, suitable consulting practice, good outlook, near Sloane-square. 9 rooms (1 suitable laboratory), 3 bathrooms, Agamatic. 40 years, ground rent £85. £7250. —Phone: SLOane 2986.

Twickenham. "Broomscroft," 176, Hampton-road. Suitable for professional purposes (formerly dentist's residence). Detached double-fronted residence on 2 floors only. 5 bedrooms, bathroom, w.c., entrance vestibule, hall, 3 reception-rooms, breakfast-room, kitchen and usual offices, brick garage. Exceptionally attractive garden. Auction 22nd April, 1954, or privately now.—BARTON, WYATT & BOWEN, 18, York-street, Twickenham (Tel.: POPesgrove 1144).

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

The British Journal of Medical Hypnotism. Quarterly. £1 1s. p.a.—Orders to the Publishers, 4, Victoria-terrace, Hove, 3, Sussex.

Dunn & Wilson Ltd., Bookbinders, Falkirk, Scotland, wish to purchase Lancet parts for 1943, 1944, 1945, and 1950. Lancet indexes for volumes i and ii, 1949 to 1952, and British Medical Journal indexes for 1949.

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Many fat people overeat because inwardly they are unhappy and ill at ease. In food they find solace, and a substitute for the affection their obesity denies them. Their hearts are in their mouths.

Such patients find dieting particularly hard, for it involves the removal of the psychological prop that supports them in their daily life, besides the ordinary difficulties.

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ANTISTIN-PRIVINE

Antihistamine Vasoconstrictor

The Decongestant

with immediate effect in

ALLERGIC RHINITIS

and conjunctivitis

The intense irritation, nasal discharge and lachrymation

RELIEVED FOR SEVERAL HOURS BY A SINGLE APPLICATION

Convenient Pocket Nebulisers for nasal application. Dropper bottles for use in nose and eye. Bottles of 4 and 20 fl. ozs.

Antistin-Privine contains 0.5% w/v 2-phenylbenzylaminomethyl imidazoline sulphate and 0.025% w/v 2-(naphthylmethyl)-imidazoline nitrate.

CIBA

'Antistin' and 'Privine' are registered trade marks : Reg. user

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